



Dyer Licenses To Be Taken Out By Automobile Board of Trade

**Present and Future Membership of Manufacturers' Organization
Provided for Up to Certain Limit Under Lump Sum Agree-
ment—Board Will Turn Over the Minor Patents**

**Suits Now Pending Against Members to Be Withdrawn When Licenses Are Issued—Negotiations
Have Been Pending for 6 Months—Patent Runs 13 Years**

CONSEQUENT upon negotiations extending over a period of more than 6 months, the Automobile Board of Trade and the Enterprise Automobile Company have finally reached an agreement.

Manufacturing licenses under the Dyer patents, covering selective transmission, and direct drive epicyclic transmission, also known as planetary, the right to use the H change-plate and other devices covered by the patents, has been secured for a certain number of the present and future members of the Automobile Board of Trade, under an agreement dated August 15, 1912. The contract securing these rights is voluminous, but its exact terms have not been made public.

Under the contract the Board of Trade pays a lump sum to the Enterprise Automobile Company, of Hoboken, N. J., the holding corporation that owns the Dyer patents and secures the right from the Enterprise company to apply for licenses for its membership without cost up to a certain specified number. It is also provided that in case the individually licensed company leaves the Automobile Board of Trade or abandons manufacturing, the license shall expire. In the contingency of the dissolution of the Board of Trade, the agreement, as such, will be nullified. Just what will be done with applications for license in excess of the specified number was not revealed by either side.

As a further consideration for the contract it is provided that the Patents Holding Association, a subsidiary of the old Association of Licensed Automobile Manufacturers and which was inherited by the Automobile Board of Trade, shall convey all

The five Dyer patents which have been assigned to the Enterprise Automobile Company by the Automobile Board of Trade, all apply to improvements in the gearing for automobiles. They are numbered respectively, 643,595, 657,650, 662,400, 662,401 and 676,223.

The first of them was applied for June 8, 1898, and was granted September 11, 1900, and covers a fixed guide plate with recesses and notches to hold the gear-shifting lever. This is patent No. 657,650.

Patent 643,595, granted February 13, 1900, is for two gears and an intermediate epicyclic gearing interposed between one of the gears and the driven axle.

Patent 662,400, granted November 27, 1900, covers the subject of two shafts with spur gearing and means for intermeshing the gear wheels so as to transmit power from the driving to the driven shaft.

Patent 662,401 is for a multiple-speed transmission gearing, and similar to the main patent, save that the gears cannot be shifted as an entirety and the principle of direct drive with all gearing quiescent is not covered.

Patent 676,223 covers a removable ridged bridge to carry the motor and operating parts.

right, title and interest held by it in the five Dyer patents covering the H-change-plate, removable rigid motor frame, planetary gear and other gear patents, to the Enterprise Automobile Company and that the licenses issued by the Enterprise Automobile Company shall include rights to manufacture under all the patents involved in the settlement and any further automobile patents that may be taken out by Leonard H. Dyer.

The rights of the Patents Holding Association consisted of exclusive rights to issue licenses under the five minor patents referred to. These rights have been held by the association for over 6 years.

The Enterprise company is left free to grant licenses to other manufacturers on a royalty basis.

The rights secured to the members of the Automobile Board of Trade are very broad.

The most important patent included in the license rights attained under the agreement is number 885,986, a division of the application filed by Leonard H. Dyer, February 3, 1900. This patent is remarkably broad in its view and is outlined in fifty-seven separate claims. It is dated April 28, 1908, and consequently will run until April 28, 1925, a trifle less than 13 years.

The Enterprise Automobile Company has issued two manufacturing licenses so far. One was to the makers of the Correja and the other to the manufacturers of the G. J. G. Three importers' licenses have been granted and over eighty individual licenses.

Suit was commenced against four companies affiliated with the Automobile Board of Trade last year and the minor suits were pressed, according to Mr. Dyer, to demonstrate what basis of

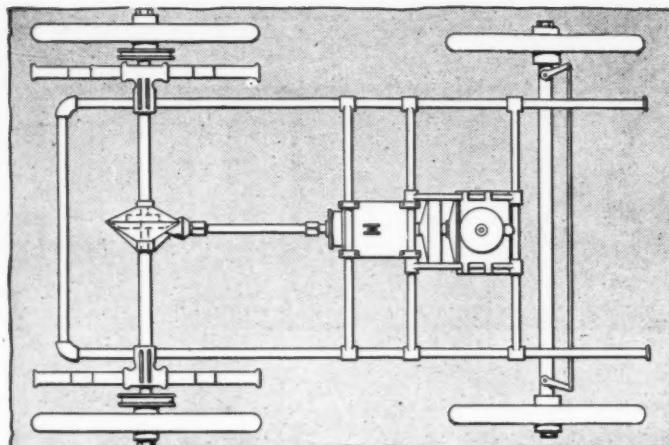


Fig. 2—Showing location of Dyer's device from above

royalty should be charged pending the determination of the main suits.

This campaign will probably be continued for a time despite the withdrawal of the main suits in question as soon as licenses have been issued to the defendant companies.

According to William A. Redding, patent counsel, associated with Frederick P. Fish, in representing the Automobile Board of Trade, the Dyer transmission patent is broader and more intimately related to the automobile trade than the Selden patent was deemed to be. The devices described by Mr. Dyer in patent 885,986 cover the selective type of transmission in fifty-seven phases, and Mr. Redding declares that the present type of selective transmission in general use throughout the industry comes within the terms of the patent.

The full text of the claims made by Mr. Dyer is reproduced on another page.

The effect of the agreement will be to check prosecutions for infringement against the licensed members of the Automobile Board of Trade and the sellers and users of their product. The four suits now pending against the Maxwell-Briscoe Motor Company, Locomobile Company, of America, Winton Motor Carriage Company and the Saurer manufacturers will be withdrawn when licenses have been granted to the four companies.

These suits were entered last summer and fall on behalf of the Enterprise Automobile Company as assignee of the patent rights of Leonard H. Dyer. They called upon the court to grant an injunction against further infringement and asked for an accounting for profits derived from past infringement and damages for the alleged infringements.

In discussing the litigation, Mr. Redding said:

"The suits have been in the United States District Court, Southern District of New York, for about a year. Even before the filing of the formal actions we had begun a systematic search of the prior art. At a cost of thousands of dollars the United States Patent Office, and the similar institutions of Switzerland, Germany, France, Belgium, Italy and Great Britain were thoroughly examined. Time and money was spent in profusion to make the search radical and comprehensive and I can say that in the 38 years during which I have handled patent matters, none has come under my notice in which more care was used or more pains exerted."

Redding Describes Breadth of Patent

The patent is imposing in its breadth and has been a threatening element in the industry up to this time. Our search disclosed a mass of data, but the industry can draw its own conclusions from the fact that my clients were strongly advised by me, as early as last winter, to take out licenses and avoid the possible danger and expense that must have followed a complete and favorable adjudication of the patents in question.

"Since that period, numerous conferences have been held between the interested parties and an option was given by the

Enterprise Automobile Company to take out licenses. This option would have expired August 15. I am not at liberty to detail the terms of the instrument nor the particulars of the agreement we have just made. There were some changes in the original proposition submitted on behalf of the Enterprise company and some changes in the counter-proposition made by my clients to the Enterprise company, but I can say that the agreement is satisfactory to both sides. It raises the shadow cast by the likelihood of suits against makers and users of automobiles produced by the Automobile Board of Trade members and gives them certain valuable rights under the patents and at the same time the acknowledgment of the validity of the patents by the act of taking licenses under them must prove agreeable to the patentee and his assigns."

It was stated by Mr. Redding that his efforts had been directed solely toward bringing about the present settlement ever since the search conducted under his direction for devices anticipating the Dyer patents had been concluded. His answer, a most voluminous document, has been finished for nearly 6 months, and while it was never filed, due notice of its readiness had been served upon the complainants. Numerous continuances have marked the progress of the suits on motion of Mr. Redding.

The Enterprise company consented to these delays so that the negotiations for settlement might be pursued. These stipulations granted extensions of time to file the answer and were renewed regularly, rule day after rule day.

The contract for licenses under the lump sum agreement provides for the present membership of the Automobile Board of Trade if applications are made and all companies that join that organization in the future up to a certain number. As a merger of the Automobile Board of Trade and the National Association of Automobile Manufacturers is pending, the members of the National Association, who are not already members of the Board of Trade, will be entitled to licenses on that basis.

The procedure by which the licenses will be granted contemplates an application by the Board of Trade to the Enterprise Automobile Company for such license. The number is not limited, but it is unquestionably true that future members of the Board of Trade will have to pay more for the license privilege than the present membership, including the N. A. A. M.

Eligible to License Under Agreement

The present membership of the Automobile Board of Trade is as follows:

Autocar Company, Buick Motor Company, Cadillac Motor Car Company, Cartercar Company, Chalmers Motor Company, Jas. Cunningham Sons and Company, Elmore Manufacturing Company, H. H. Franklin Manufacturing Company, Garford Company, Haynes Automobile Company, Hudson Motor Car Company, International Motor Company, Jackson Automobile Company, Knox Automobile Company, Locomobile Company, of America, Lozier Motor Company, Marquette Motor Company, Matheson Automobile Company, Mercer Automobile Company, Metzger Motor Car Company, Mitchell-Lewis Motor Company, Moline Automobile Company, Moon Motor Car Company, National Motor Vehicle Company, Nordyke and Marmon Company, Oakland Motor Car Company, Olds Motor Works, Packard Motor Car Company, Peerless Motor Car Company, Pierce-Arrow Motor Car Company, Pope Manufacturing Company, Premier Motor Manufacturing Company, Pullman Motor Car Company, Rapid Motor Vehicle Company, Reliance Motor Truck Company, Reo Motor Car Company, Selden Motor Vehicle Company, F. B. Stearns Company, Stevens-Duryea Company, S. G. V. Company, E. R. Thomas Motor Company, United States Motor Company, Warren Motor Car Company, White Company, Willys-Overland Company, Winton Motor Carriage Company.

The list totals forty-six. In the event of application for license of the constituent companies of the United States Motor Company and the International Motor Company, this number would be increased to fifty-one.

The full roster of the N. A. A. M. includes the following cars:

Auburn, Abbott, Alco, American, Detroit, Electric, Apperson, Austin, Autocar, Babcock electric, Baker, Glide, Brush, Buick, Cadillac, Cartercar, Chalmers, Cutting, Cole, Columbia, Firestone-Columbus, Corbin, Stoddard-Dayton, De Tamble, Duryea, Elmore, E-M-F, Federal truck, Fiat, Ford, Franklin, Garford, Grabowsky, Gramm, Great Western, Haynes, Hewitt, Hudson, Hupmobile, Imperial, Interstate, Jackson, Rambler, Kelly truck, Kissel, Knox, Krit, Locomobile, Lozier, Stutz, International Motor Car Manufacturing Company, Marquette, Matheson, Maxwell, Everitt, Mitchell, Moline, Moon, National, Marmon, Oakland, Ohio electric, Oldsmobile, Packard, Peerless, Pierce-Arrow, Case, Pope, Premier, Pullman, R. C. H., Rapid, Rauch and Lang, Regal, Reliance, Reo, Royal Tourist, Selden, Simplex, Staver, Stearns, Stevens-Duryea, Studebaker, Thomas, Velie, Walter, Waverley, White, Winton, Woods, Overland, Warner. This makes a total of ninety-two members.

There are forty-four members of the N. A. A. M. who are not represented in the Board of Trade, but among them are six makers of electrics, a duplication of the Studebaker Corporation and E-M-F and several companies that are not active at the moment. The United States Motor Company, comprising the Brush, Maxwell, Columbia, Stoddard-Dayton and Sampson lines is expected to take out four licenses for the last four companies named. This will bring the total number of licenses to be granted to the members of the merged organizations about seventy-five.

In the list of members are the names of several companies whose product is deemed to be outside the patents. Precisely which companies are included in this list will appear when the licenses are granted.

One Reason for Merger Disclosed

The outcome of the successful negotiations uncovers one of the main reasons for the pending merging between the two national organizations. The membership of the Board of Trade is almost entirely included in the National association, but the National Association under its charter is not allowed to hold patent rights as such. Therefore, if the license rights are assumed by the Automobile Board of Trade and the two organizations are merged, the members of the National Association will be able to enjoy the privilege of license rights granted through the Board of Trade.

An interesting sidelight on the matter is shed by a statement made to THE AUTOMOBILE by Herman Cuntz, patent counsel for the Board of Trade. Mr. Cuntz returned from a trip abroad recently, having been commissioned to conclude negotiations between the General Vehicle Company and the Daimler company for the exclusive American rights to manufacture Daimler commercial vehicles by the former company. Trucks of this type use a selective type of transmission under British patents dated in 1898. Mr. Cuntz was asked whether this device did not anticipate the Dyer patents in such a way as to defeat them; he replied in the negative, saying that there were vital points of difference between the Daimler patented device and that covered by the Dyer patents. The chief point, he said, was that the Dyer device is shiftable as an entirety, while that employed since 1899 in the Daimler commercial wagons constitutes a series of shifts in order to vary speed and reverse. Mr. Cuntz characterized the later improvements now used in the Mercedes and Daimler pleasure automobiles as changes and modifications of the original idea.

The main Dyer patent in the limelight at present is number 885,986, issued April 28, 1908, on application filed January 22, 1906, but in reality extending back in its effect to the statutory period before February 3, 1900. The reason for this retroactive effect of the patent is that it is declared to be a division of an application for patent filed at that date by Leonard H. Dyer and which was later issued as patent 921,963 under date of May 18, 1909.

Patent 921,963 underlies the other as a sort of foundation for it. It is for an automobile vehicle, covering improvements in the frame, driving gear and changing and reversing mechanisms.

According to the language of the patent, the object of the in-

vention is to improve automobile construction by direct driving connections between the motor and the differential with such reduction as is necessary owing to the relatively different speeds of such parts. In connection with this direct drive mechanism is provided an additional low speed gearing, and if necessary, a back or reverse gearing, either of which will be introduced when required.

The invention also comprises in a rectangular metal framework, supported by means of springs, upon wheels with a driving motor carried thereon. Connection is made between the driving engine and the longitudinal shaft by means of the usual friction clutch and the shaft may be provided if necessary with one or more flexible or knuckle joints to permit the framework to oscillate independently of the wheels and yet allow the driving mechanism to run freely.

What Underlying Patent Contains

To provide a speed-changing gear the longitudinal shaft is formed in two parts with a releasable connection between, combined with means for rotating the two shaft parts at different speeds. The invention is broad enough to permit of any form of mechanism being used for this purpose, but an auxiliary is preferred, so mounted as to be parallel with the two parts of the main shaft, with a system of spur-gearing, which is normally not in mesh but which can be inter-meshed after the two shaft parts have been separated.

Combined with the speed reducing gear is a reversing gear, which may be of any type but a series of gears mounted upon another auxiliary shaft with bevel gearing so arranged that the two parts of the longitudinal shaft may be caused to rotate in opposite directions is preferred.

The claims under this patent number three and are as follows:

1—The combination in a vehicle of a spring-supported frame, driving and steering wheels, a motor mounted upon the front of the frame, a shaft driven by such motor and in line with the shaft of the motor, the said shaft being longitudinally arranged substantially at an equal distance between the wheels and substantially parallel with the ground, a friction clutch connecting the shaft to the motor, a second shaft in line with the first shaft, means for directly connecting the two shafts for driving the second shaft without reduction in speed, means for breaking the connection between the two shafts and for connecting them together through power transmitting mechanism, affording a reduced speed, a differential gear between the second shaft and the wheels of the vehicle, and a reversing gear for reversing the direction of travel of the vehicle.

2—The combination in a vehicle of a spring supported frame, driving and steering wheels, a motor mounted upon the front of the frame, a shaft driven by such motor and in line with the shaft of such motor, the said shaft being longitudinally arranged between the wheels, a friction clutch connecting the shaft to the motor, a second shaft in line with the first shaft, means for directly connecting the two shafts for driving the second shaft without reduction in speed, and means for breaking the connection between the two shafts and for connecting them together through power-transmitting mechanism, affording a reduced speed.

3—The combination in a vehicle, of a spring supported frame, driving and steering wheels, a motor mounted upon the front of the frame, a shaft driven by such motor and in line with the shaft of the motor, the said shaft being longitudinally arranged between the wheels, a friction clutch connecting the shaft with the motor, a second shaft in line with the first shaft, means for directly connecting the two shafts for driving the second shaft without reduction of speed, means for breaking the connection between the two shafts and for connecting them together through power-transmission mechanism, affording a reduced speed, and a reversing gear for reversing the direction of travel of the vehicle.

Referring to the accompanying illustrations designated as

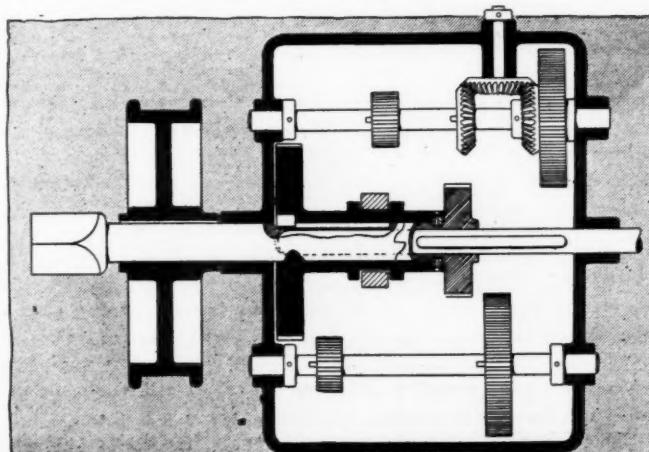


Fig. 3—Low speed and reversing gear claimed in patent

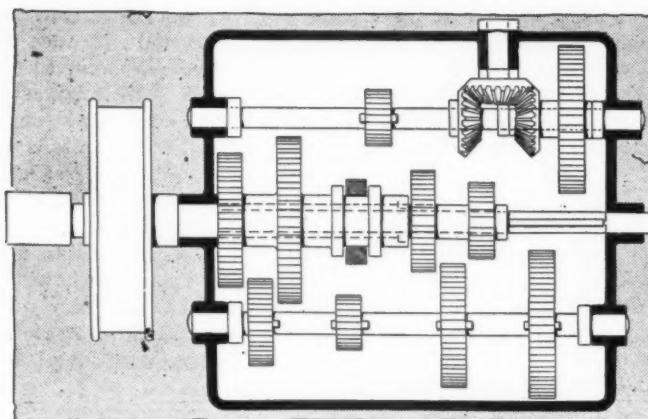


Fig. 5—Low and reverse with additional forward speeds

Figures 2, 3, 5, 6 and 7 and taken from the official drawings shown in the patent papers, Fig. 2 shows the location of the patented device, looking down upon a motor vehicle chassis; Fig. 3 shows the low speed and reversing gears; Fig. 5 shows the low, reverse and additional forward speeds secured by the addition of extra secondary gears upon one of the auxiliary shafts together with extra gears on the main driving shaft. Figs. 6 and 7 are views of the device from above and from one end.

The claims of patent 885,986 are as follows:

1—In a transmission for automobiles, the combination of a driving member, a driven member, a driving gear for the former, a plurality of intermediate gears, including a reversing gear and means, including mechanism shiftable as an entirety for driving said driven member through any one of said intermediate gears.

2—In a transmission gear for automobiles, the combination of a driving member, a driven member, a driving gear for the former, a plurality of intermediate gears including a reversing gear and means, including mechanism shiftable as an entirety, for coupling said driving member to said driven member and for also driving said driven member through any one of the said intermediate gears.

3—Transmission mechanism for motor vehicles, the same comprising a driving member, a driven member, means to couple said driven member to said driving member to be driven by the latter and means comprising mechanism shiftable as an entirety to drive said driven member at a different speed for said driving member and to drive said driven member in reverse direction from said driving member.

4—Transmission mechanism for motor vehicles, the same comprising a driving member, a driven shaft axially aligned therewith, means to couple said member and shaft, one to the other for direct drive of the latter by the former, a plurality of gears arranged out of line with the axis of said shaft and driven by said member, and a shiftable transmission device on said shaft and adapted to engage the said plurality of gears to drive said shaft in the same, and also in a reverse direction.

5—In a transmission gear for automobiles, the combination of a driving member, a driven member, and means comprising mechanism shiftable as an entirety coupling said driving member to said driven member to drive the latter from the former and for varying the speed and direction of movement transmitted from said driving member to said driven member.

6—Transmission mechanism for automobiles, the same comprising a driving shaft, a plurality of fixed intermediate gears, including a reversing gear, means for supporting said gears, a driven shaft and means comprising a longitudinal, shiftable transmission device to rotate the latter from the driving shaft to any one of said intermediate gears.

7—Transmission mechanism for automobiles, same comprising a driving shaft, gear supporting means driven therefrom at a reduced speed, a plurality of fixed intermediate gears, including a reversing gear, a driven shaft and means comprising a longitudinal, shiftable transmission device to rotate the latter from the driving shaft through any one of said intermediate gears.

Claims Cover Shiftable Mechanism

8—TRANSMISSION mechanism for motor vehicles comprising a driving member, a driven member, a shiftable transmission member, means coordinate therewith to couple said driven member to said driving member, one or more stationary intermediate gears driven by said driving member and means to bring said transmission member into separate engagement and disengagement with said one or more intermediate gears.

9—Transmission mechanism comprising a driving member and a driven member adapted to be driven one by the other at the same speed, at different speeds, or in a reverse direction and mechanism longitudinally shiftable as an entirety for obtaining such changes in speed and direction.

10—Transmission mechanism for motor vehicle comprising a driving member, a driven shaft axially aligned therewith, a shiftable transmission device on said shaft, means for coupling said driving member and said driven shaft one to the other for the direct drive of the latter by the former, one or more stationary gears arranged at one side of the axis of said shaft and driven by said driving member and means to shift such transmission device into engagement with the said one or more gears.

11—In a motor vehicle, a motor, clutch, driving gear and driven shaft, all axially aligned, intermediate gears between said driven shaft and driving gear, mechanism shiftable as an entirety to couple said driven shaft to said driving gear and to drive said shaft from said driving gear through any one of said intermediate gears, a jack-shaft arranged at an angle with said driven shaft and driven therefrom and vehicle driving wheels connected with and driven from said jack-shaft.

12—In a motor vehicle, a motor, clutch, driving shaft and driven shaft, all axially aligned, means comprising mechanism shiftable as an entirety for varying the speed and direction of movement transmitted from said driving shaft to said driven shaft, a jack-shaft arranged at an angle with said driven shaft and driven therefrom and vehicle driving wheels connected with and driven from said jack-shaft.

13—In a transmission gear for automobiles the combination of a driving member, a driven member, axially aligned therewith and means comprising mechanism shiftable as an entirety to couple said driving and driven members together and to vary the speed and direction of movements transmitted from said driving member to said driven member.

14—In a speed changing gear for motor vehicles, the combination with a motor shaft, a driven shaft, means for connecting the two together to secure high speed, a low speed gearing consisting of a plurality of gear wheels caused to engage by longitudinal shifting movements and means for producing reverse rotation of the driven shaft.

15—In a motor vehicle the combination with the motor and driving wheels, of a gearing connecting the driving wheels and motors, the said gearing comprising a longitudinal shaft and a clutch connecting the shaft to the motor, and by means of which it will be driven, of means for rotating the wheels and a portion of the shaft at a different speed ratio, the said means including a jaw-clutch and longitudinally sliding gears, a single lever for sliding the gears and engaging and disengaging the jaw-clutch and a reverse gearing, and means operated by the said lever for engaging the reverse gearing.

16—In a motor vehicle the combination with a driving motor and driving wheels, of a gearing connecting the two, the said gearing comprising longitudinally aligned driving and driven shafts and a clutch connecting the driving shaft to the motor, and by means of which it will be driven, connections between the driven shaft and the driving wheels, gearing connecting the longitudinal shaft to positively drive the driven shaft at low or high speed, and comprising longitudinally sliding gears and a second clutch, and a single manually operated sliding device for sliding the gears, and for engaging the second clutch.

17—In a motor vehicle, the combination with a driving motor and driving wheels, of a gearing connecting the two, said gearing comprising longitudinally aligned driving and driven shafts and a clutch connecting the driving shaft to the motor and by means of which it will be driven, connections between the driven shaft and the driving wheels, gearing connecting the longitudinal shafts to positively drive the driven shaft at low or high speed, and comprising longitudinally sliding gears and a second clutch, and a single actuating lever for sliding the gears and for engaging and disengaging the second clutch.

Gears Still When Disconnected

18—In a motor vehicle, the combination with the motor and driving wheels, of a gearing connecting the two, the said gearing comprising longitudinally aligned driving and driven shafts and a clutch for connecting the two, for driving the driven shaft at high speed, and reduced speed gearing for positively driving the driven shaft at a reduced speed and means for engaging the said reduced speed gearing, the said reduced speed gearing being entirely disconnected when not in use, and being introduced and disengaged by a longitudinally sliding movement.

19—In a motor vehicle, the combination with the motor and driving wheels, of a gearing connecting the two, the said gearing comprising longitudinally aligned driving and driven shafts and a clutch for connecting the two for driving the driven shaft at high speed, and reduced speed gearing and reverse gearing for positively driving the shaft at a reduced speed, or in the reverse direction, and means for engaging the said reduced gearing and reverse gearing, the said reduced speed gearing and reverse gearing being entirely disconnected when not in use, and being introduced and disengaged by a longitudinally sliding movement.

20—In a motor vehicle the combination with the motor and driving wheels, of a gearing connecting the two, the said gearing comprising a longitudinal shaft, a clutch connecting the shaft to the motor and by means of which it is driven, connections between the shaft and the driving wheels, and a change speed device for rotating a portion of the shaft at a less speed than the motor, the said change speed device comprising an auxiliary shaft and gears on the longitudinal shaft, and means for intermeshing the gears by a sliding movement.

21—In a motor vehicle, the combination with the motor and driving wheels, of a gearing connecting the two, the said gearing comprising a longitudinal shaft, a clutch connecting the shaft to the motor, and by means of which it is driven, connections between the shaft and the driving wheels and a change speed device for rotating a portion of the shaft at a less speed than the motor, the said change speed device comprising an auxiliary shaft, and gears on the longitudinal shaft and means for intermeshing the gears by a sliding movement.

22—In a motor vehicle the combination with the motor and driving wheels, of a gearing connecting the two, the said gearing comprising a longitudinal shaft, a clutch connecting the shaft to the motor, and by means of which it is driven, connections between the shaft and the driving wheels and a change speed device for rotating a portion of the shaft at a less speed than the motor, the said change speed device comprising an auxiliary shaft, mounted in rigid bearings, gears rigidly mounted on the auxiliary shaft and gears on the longitudinal shaft, and means for intermeshing the gears by a sliding movement.

23—In a motor vehicle the combination with a driving shaft made in two parts, of a clutch made in two parts and connecting the shaft parts, one of the clutch parts sliding upon its supporting shaft part, a gear connected to the sliding clutch part and sliding with it, an auxiliary shaft, gears thereon and means for sliding the moving clutch part and its companion gear to disengage the two shaft parts and engage the gear with a gear on the auxiliary shaft, to cause the two shaft parts to rotate at a different speed relation.

24—In a motor vehicle the combination with a driving shaft in two parts, of a clutch made in two parts and connecting the shaft parts, one of the clutch parts sliding upon its supporting shaft part, a gear connected to the sliding clutch part and sliding with it, a gear on the other shaft part and rotating with it, an auxiliary shaft gear thereon, the said shaft being mounted in rigid bearings and means for sliding the moving clutch part and its companion gear to disengage the two shaft parts and engage the gear with a gear on the auxiliary shaft, to cause the two shaft parts to rotate in a different relation.

25—In a motor vehicle, the combination with a driving shaft made in two parts, of a clutch made in two parts and connecting the two shaft parts, one of the clutch parts sliding upon its supporting shaft part, a gear connected to the sliding clutch part and sliding with it, a gear on the other shaft part and rotating with it, an auxiliary shaft, gears thereon, the gears being rigidly mounted on the shaft and means for sliding the moving clutch part and its companion gear to disengage the two shaft parts and engage the gear with a gear on the auxiliary shaft to cause the two shaft parts to rotate in a different speed relation.

26—In a motor vehicle the combination with a driving shaft made in two parts, of a gear case, a clutch made in two parts and connecting the two shaft parts, one of the clutch parts sliding upon its supporting shaft part, a gear connected to the sliding clutch part and sliding with it, a gear on the other shaft part and rotating with it, an auxiliary shaft, mounted in rigid bearings, carried by the gear case, gears movable in a fixed plane with respect to said shaft, on the auxiliary shaft and means for longitudinally sliding the moving clutch part and its companion gear

to disengage the two shaft parts and engage the gear with a gear on the auxiliary shaft to cause the two shaft parts to rotate in a different speed relation.

27—In a motor vehicle, the combination with a driving shaft made in two parts, of a gear case, bearings on the gear case for the shaft parts, a clutch made in two parts and connecting the two shaft parts, one of the clutch parts sliding upon its supporting shaft part, a gear connected to the sliding clutch part and sliding with it, a gear on the other shaft part and rotating with it, an auxiliary shaft, mounted in rigid bearings, carried by the gear case, gears on the auxiliary shaft, the said gears being rigidly mounted on the shaft and means for sliding the moving clutch part and its companion gear to disengage the two shaft parts and engage the gear with a gear on the auxiliary shaft to cause the two shaft parts to rotate in a different speed relation.

28—In a motor vehicle, the combination with a shaft made in two parts of a gear case, bearings on the gear case for the shaft parts, a clutch made in two parts and connecting the two shaft parts, one of the clutch parts sliding upon its supporting shaft part, a gear connected to the sliding clutch part and sliding with it, a gear upon the other shaft part and rotating with it, an auxiliary shaft, mounted in rigid bearings carried by the gear case, gears on the auxiliary shaft, and means carried within the gear case for sliding the moving clutch part and its companion gear to disengage the two shaft parts and engage the gear with a gear on the auxiliary shaft to cause the two shaft parts to rotate in a different speed relation.

29—In a motor vehicle the combination with a driving shaft made in two parts, of a gear case, bearings on the gear case for the shaft parts, a clutch made in two parts and connecting the two shaft parts, one of the clutch parts sliding upon its supporting shaft part, a gear connected to the sliding clutch part and sliding with it, a gear on the other shaft part and rotating with it, an auxiliary shaft mounted in rigid bearings carried by the gear case, gears on the auxiliary shaft, the said gears being rigidly mounted on the shaft, and means carried within the gear case for sliding the moving clutch part and its companion to disengage the two shaft parts and engage the gear with a gear on the auxiliary shaft to cause the two shaft parts to rotate in a different speed relation.

Two Sections Rotate Separately

30—A motor vehicle having driving wheels, a motor, a shaft in line with the motor shaft, a clutch connecting the two to cause the shaft to rotate at the same speed as the motor, the shaft being longitudinally arranged between the driving wheels and divided into two sections, a device for connecting and disconnecting the two sections for causing them to rotate as an entirety or to permit independent rotation, means for rotating the rear section of the shaft at a lesser speed than the motor or in a reverse direction, said means including sliding gears, longitudinally movable in a fixed plane with respect to said shaft and mechanism for so moving said gears, and connections between the rear section of said shaft and the driving wheels, substantially as set forth.

31—In a motor vehicle, the combination with a shaft formed of two parts, a connecting clutch and a gear on each shaft part, of a second shaft and gears thereon, and a single lever for shifting the gears on the first shaft and actuating the clutch, substantially as set forth.

32—Transmission for a motor vehicle, having a shaft formed of two parts, one telescoping within the other, connecting clutch, a gear carried by one clutch member, a second gear connected to the first gear but freely rotatable with respect thereto, a second shaft, and gears thereon and a single lever for shifting said first gears, and actuating the clutch substantially as described.

33—In a motor vehicle, the combination with a shaft formed of two parts, of a clutch connecting the two parts, a sleeve surrounding the abutting ends of the two parts, a gear formed integral with the clutch, and engaging with one part, a second gear formed integral with the sleeve and engaging with the other part, an auxiliary shaft, gears thereon disengaged at the high speed, intermediate gears interposed between the gears on the second shaft, and means for moving the sleeve, clutch and gears to disengage the two shaft parts and intermesh the gears, whereby the two parts of the shaft may be caused to rotate in different speed relations, substantially as described.

34—Transmission gearing for a motor vehicle having a shaft formed of two parts, one telescoping within the other, a connecting clutch, a gear integrally formed upon one clutch member, a second gear, a sleeve thereon, connecting with, but freely rotatable with respect to the first gear, a second shaft with gears thereon and a single shifting lever for sliding said first gears and disengaging the clutch, substantially as described.

35—In a motor vehicle, a gear case therefor, having a cover and supporting brackets, with a set of common securing bolts.

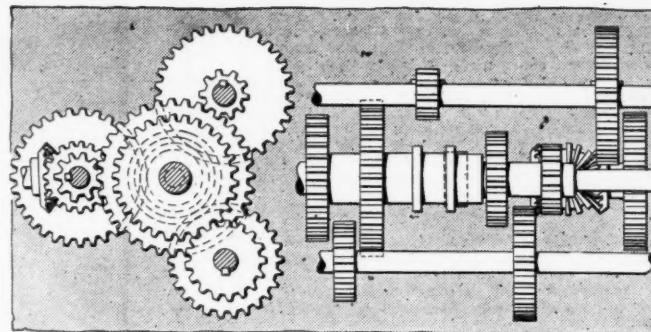
36—In a motor vehicle, a combination of a shaft therefor, formed in two parts, a fixed clutch member on one part, a movable clutch member on the other, gears connected to said movable member, a plurality of auxiliary shafts, gears thereon, and means for sliding said movable clutch member and connected gears along the shaft to disengage the clutch and intermesh the gears serially, substantially as and for the purposes set forth.

37—In a motor vehicle, the combination with the shaft, formed in two parts, of a clutch for connecting parts together to cause the shaft to rotate as an entirety, slideable gears on the shaft's parts, connecting to and working with one clutch member, auxiliary shafts with gears thereon, and means, which being moved, will first disengage the clutch and move the gears to a position to engage with the gears on one auxiliary shaft to cause the shaft's parts to partake of the different speed relations, and the continuation of the movement will cause the gears to engage with the gears on the other auxiliary shaft and cause the shaft's parts to rotate in opposite directions, substantially as and for the purposes set forth.

38—In a motor vehicle, the combination with an operating motor, of connections between the motor and the driving wheels, comprising a two-piece shaft connected thereto, connections to said shaft and driving wheels, a clutch connecting the two parts of the shaft, a gear carried by one part of the shaft, a second gear carried by the other part, connections between the gears and the clutch for moving altogether, an auxiliary shaft, two gears secured thereto, out of mesh with the other two gears at the high speed, a second auxiliary shaft, two gears secured thereto, normally out of mesh with the first two gears, intermediate gearing interposed between the two gears on the second auxiliary shaft, and means for disengaging the clutch and intermeshing the different gears, whereby the two parts of the shaft may be caused to rotate in different speed relations.

39—In a motor vehicle, the combination with the driving shaft made in two parts, of the clutch connecting the two parts, a sleeve surrounding the abutting ends of the two parts, a gear formed integral with the clutch, a second gear formed integral with the sleeve and engaging with the other part, and an auxiliary shaft, gears thereon, disengaged at a high speed, and means for moving the sleeve, clutch and gears to disengage the two shaft parts and intermesh the gears, whereby the two parts of the shaft may be caused to rotate in different speed relations.

40—In a motor vehicle, the combination with the driving shaft made in two parts of a clutch connecting the two parts, a sleeve surrounding the abutting ends of the two parts, a gear formed integral with the clutch,



Figs. 6 and 7—End and top views of patented device

a second gear formed integral with the sleeve and engaging with the other part, an auxiliary shaft, gears thereon, disengaged at the high speed, a second auxiliary shaft, gears thereon, disengaged at the high speed, and means for moving the sleeve, gears and clutch to disengage the two shaft parts and intermesh the gears, whereby the two parts of the shaft may be caused to rotate in different speed relations.

41—In a motor vehicle, the combination with the driving shaft made in two parts, of a clutch connecting the two parts, a sleeve surrounding the abutting ends of the two parts, a gear formed integral with the clutch and engaging with one part, a second gear formed integral with the sleeve and engaging with the other part, and an auxiliary shaft, gears thereon, disengaged at the high speed, intermediate gearing interposed between the gears, means for moving the sleeve, clutch and gears to disengage the two shaft parts and intermesh the gears, whereby the two parts of the shaft may be caused to rotate in different speed relations.

42—In a motor vehicle, the combination with a motor and driving wheels, of connections between said motor and the driving wheels, including a two-piece shaft, clutch connecting the two shaft pieces, gears upon the shaft pieces and auxiliary shaft with gears thereon, said gears being so arranged as to be out of mesh when the clutch is engaged, and an element longitudinally shiftable as an entirety for actuating said clutch and intermeshing said gears, substantially as and for the purposes set forth.

43—In a motor vehicle, the combination with the shaft formed in two parts, one telescoping within the other, of a connecting clutch, a gear integrally formed upon one clutch member, a second gear connected to the first gear but freely rotatable with respect thereto, a second shaft, and gears thereon and a single lever for shifting said first gears and actuating the clutch, substantially as described.

44—In a motor vehicle, the combination with the driving shaft formed in two parts, of a fixed clutch member on one part, a sliding clutch member on the other part, a gear rigidly connected to said sliding member, a gear rotatably connected to said sliding member, an auxiliary shaft, gears thereon, and means for moving said sliding clutch member and connected gears along the shaft to disengage the clutch and intermesh the gears, substantially as and for the purposes set forth.

45—In a motor vehicle, the combination with an operating motor, of connections between the motor and the driving wheels, comprising a two-piece shaft connected thereto, the connections between said shaft and driving wheels, a clutch connecting the two parts of the shaft, a gear carried by one part of the shaft, a second gear carried by the other part, connections between the gears and clutch for moving all together, an auxiliary shaft, two gears secured together, out of mesh with the other two gears at the high speed, a second auxiliary shaft, two gears secured thereto out of mesh with the first two gears at the high speed, and means for disengaging the clutch and intermeshing the gears, whereby the two parts of the shaft may be caused to rotate in different speed relations.

46—In a motor vehicle, the combination of the driving wheels, the motor, the driving shaft between the motor and driving wheels, made of two longitudinally aligned sections, a clutch arranged to couple the sections so that the driving shaft may turn as an entirety and longitudinally sliding speed reducing gearing arranged to connect the shaft sections, and so co-ordinated with said clutch that the engagement of said gearing will effect the prior disengagement of said clutch and vice versa, substantially as described.

Details of Dyer's Transmission Claims

47—In combination in a change speed mechanism, a driving shaft, a driven shaft, gears mounted upon said driving shaft and driven shaft, intermediate gears on an axis in fixed relation with the axis of said driving and driven shafts, means for transmitting power from said driving shaft to said driven shaft through said intermediate gears, and means movable on the driven shaft for directly connecting the driving and driven shaft with all intermediate gears at rest.

48—In combination in a change speed mechanism, a driving and a driven shaft arranged in the same axial line and adapted to have independent movement, change gears carried upon the driving and driven shafts, means for varying the position of said gears, power transmitting means adapted to connect a gear on said driving shaft and on said driven shaft and a clutch mechanism for directly connecting said driving and driven shafts.

49—In combination in a change speed mechanism, a driving shaft, a gear borne upon said shaft, a counter shaft, a gear borne upon the counter shaft and meshing with the gear upon the driving shaft, a driven shaft operatively arranged with relation to the driving shaft and provided with a clutch mechanism adapted to clutch it directly to said shaft, and intermediate gears borne upon the driven shaft and counter shaft, whereby the speed of the former may be varied with relation to the speed of the latter.

50—In combination in a change speed mechanism, a driving shaft and driven shaft, a driving gear for the former, a plurality of intermediate gears including a reversing gear and means for driving said driven shaft through any one of said intermediate gears.

51—In combination in a change speed mechanism, a driving shaft, a driven shaft, a plurality of transmission gears mounted to slide thereon, a plurality of intermediate gears arranged to engage and drive respectively, but singly, the said transmission gears, and means to couple said driven shaft directly to said driving shaft.

52—In a motor vehicle, the motor, clutch, driving gear and driven shaft, all axially aligned, means to drive said driven shaft from said driving gear at the same and also at different speeds, a jack-shaft arranged at an angle with said driven shaft and driven therefrom, and vehicle driving wheels connected with and driven from said jack-shaft.

53—In combination in a change speed mechanism, a driving shaft, a

driven shaft, a counter shaft in fixed relation to said driving and driven shafts, an operative gearing on said shafts, and inclosing casing, a bearing in said casing for one end of the driven shaft, the other bearing for said driven shaft being in the driving shaft.

54—In combination in a change speed mechanism, a driving shaft and a driven shaft, operatively arranged, an inclosing casing, a bearing in said casing for one end of one of said shafts, the other end of said shaft having a bearing in the other shaft, a counter shaft in fixed relation to said driving and driven shafts and a plurality of gears connecting said counter driving and driven shafts.

55—In combination in a change speed mechanism, a driving shaft and a driven shaft axially aligned, a counter shaft in fixed relation to said driving and driven shafts, a plurality of gears connecting and said counter, driving and driven shafts, an inclosing casing, a bearing in said casing for one end of the driven shaft, the other end having a bearing in the driving shaft.

56—In combination in a change mechanism, a driving shaft and a driven shaft, the driven shaft having a bearing in the driving shaft, and means movable on the driven shaft to engage the surrounding end of the driving shaft to rotate the two shafts at the same speed, a counter shaft in operative fixed relation to said driving and driven shafts and a plurality of gears connecting said counter, driving and driven shafts.

57—In a transmission mechanism, for motor vehicles, a casing, a driving shaft or shaft section projecting into said casing at one side, a bearing therefor, in the wall of said casing, a gear and clutch part fixedly secured on or integral with said shaft section, and entirely on one side of said bearing within said casing, a driven shaft in said casing having a movable complementary clutch part, a counter shaft in fixed relation to said driving and driven shaft, and a plurality of gears on said shaft whereby varying speeds are transmitted to a shaft projecting from said casing.

High-lights in Inventor's Life

Leonard H. Dyer was born May 13, 1873, in Washington, D. C. He was educated in the schools of Washington and later at Columbian University and Georgetown University, specializing in mechanics and electric science. From early boyhood his trend toward inventions has been apparent. Among his inventions is numbered an electric steering gear for ships, which is now owned by the General Electric Company and several improvements upon apparatus related to the cotton industry.

Early in the career of Mr. Dyer he became interested in automobiles and he has always held the belief gained from his investigation that the internal combustion engine would be a favorite of destiny.

In 1897 he devoted the entire year to the building of automobiles and constructed three cars of full size that were successfully demonstrated, all using gasoline engines, thus indicating that he was among the pioneer builders of the industry.

In 1903 he entered the firm of Dyer, Dyer and Taylor and engaged in the practice of patent law. In 1908 the two patents mainly involved in the license rights granted to the Automobile Board of Trade were transferred to the Enterprise Automobile Company.

John R. Taylor has been president of that corporation until recently, when he resigned and Mr. Dyer was chosen president in his stead.

Mr. Dyer is married and resides at Greenwich, Conn.

In speaking of his patents and particularly referring to patents



Leonard Huntress Dyer
(Photo by Mrs. Dyer)

885,986 and 921,963, Mr. Dyer said recently:

"When Mr. Redding said that a comprehensive research of the prior art developed nothing sound upon which a defense against the patents could be based, he confirmed my opinion. Any such search as he prosecuted is bound to turn up a mass of data, but in this instance none of it could be applied by the defense. This is demonstrated by the fact that Mr. Redding's clients have agreed to take out manufacturing licenses.

"There has been a widely circulated opinion that the Dyer patents were allowed to sleep in the Patent Office and after the industry had grown up around them were issued. This is not true. The exact fact in the case is that through interference proceeding with the Renault patent, application for which was pending coincidentally with my own, the dates and

claims of my patent were revealed and the industry appropriated my idea and incorporated it into the modern automobile.

"Imagine, if possible, the elimination of my idea from modern construction and then the importance of my device will be obvious.

"As to the prior art, there is none. Of course there can be found a record of a vast amount of ineffectual endeavor, but there is a difference between ineffectual endeavor and desire to attain a certain result and the actual accomplishment of such a result.

"The American situation is embodied in the Dyer patents, 1900, Renault patent 1901, Law, Leonard and Riker 1903. These records are all available to searchers and if any of them antedated my patents, Mr. Redding surely would have discovered them. In the foreign art there is nothing effective, despite the large quantity of abortive and ineffectual material revealed by a careful search.

"I demanded interference proceeding in the Patent Office when the Renault patent was issued and the whole record of the proceedings is available. The fact that despite the proceedings, my patent was issued as antedating that of Renault ought to be conclusive. The French Renault patent was issued in 1904.

"As a firm believer in the permanent usefulness of the automobile, I will say that I am on the constructive side. I do not wish to tear down; I wish to aid in building up."

Prosecution of individual owners of automobiles by the Enterprise Automobile Company for alleged infringement of the Dyer transmission patents has not yet been checked, despite the favorable outcome of the negotiations with the Automobile Board of Trade. The following suits have been entered this week in the United States District Court on behalf of the Enterprise Automobile Company: George Litwin, Frontenac; Sidney Ascher, Decauville; Oscar L. Lines, Mais; Edwin F. Brush, C. G. V.; John Beshar, Charron, and Desire E. Manduse, Clement-Bayard.

Supply Company in Receiver's Hands

COLUMBUS, OHIO, Aug. 12—The Brandt & Johnston Auto Supply Company, which has been operating a plant in South Columbus, O., for a number of years, was thrown in the hands of Fred W. Herbst as receiver upon the application of the City National Bank of Columbus, who claimed to be unable to collect a judgment of \$5,000 against the corporation. The officials of the company did not oppose the action, although they contended the concern is solvent. It is alleged that bill receivable more than offset the debts of the concern and that \$200,000 worth of business is on the books. The plant will be continued in operation under Charles Barndt and W. R. Johnson as managers. The petition was one of the results of the death of Dr. L. M. Early, a heavy stockholder in the company.

Prest-O-Lite Sues Searchlight

INDIANAPOLIS, IND., Aug. 12—Another suit defending its patents has been brought in the Federal Court in this city by the Prest-O-Lite Company. The new case is directed against the Searchlight Gas Company of Ohio and is very similar to cases which have been brought against other concerns manufacturing and selling devices which the Prest-O-Lite company claimed were infringements on its patents.

An injunction against the infringement of the Prest-O-Lite patents and an accounting are demanded in the suit. It is alleged that the Searchlight company has refilled Prest-O-Lite tanks. These tanks are trade-marked and it is alleged that refilling the tanks is an infringement of this trade-mark.

The Searchlight Gas Company has an office in this city.

Report on Oldfield Bill

Calls Attention to Numerous Evils Which the Measure Will Scotch— Limits Rights to 19 Years

WASHINGTON, D. C., Aug. 10—Of vital interest to the motor car and accessory industries is the report made to Congress this week on the Oldfield patent bill. Broad changes in the patent laws, recommendations for changes in the equipment and organization of the patent office are outlined in the report. The bill has been fought bitterly by manufacturers all over the country.

It seeks to make great changes in existing conditions, one feature being a section prohibiting a manufacturer from bringing suit for infringement of patents against a dealer who sells the manufacturer goods at a less price than that fixed by the manufacturer as a retail price.

"As to the wealthy corporations," says the report, "it has become obvious that the skilful handling of patent cases gives them an untold advantage over their smaller competitors. For them a well organized patent department is a reliable machine, where money is the lubricant. This machine, in its slow but grinding way, can reduce to pulp any of the smaller competitors. For large corporations, the maintenance of such a machine, with a staff of lawyers and experts, is merely a small side expense. By its aid they can bluff their weaker competitors into quick submission. If this is not successful, they can drag out a patent suit indefinitely until the weak opponent, unable to bear the ever-increasing expenses, collapses and withdraws."

The evils spoken of in the report cover a broad field of activity. The habit of manufacturers fixing a retail price for their

goods is one, the custom of manufacturers of patented articles stipulating in what manner they shall be used is another; and the third evil is a phase of the trust problem, whereby owners of patents suppress them with a view to killing competition.

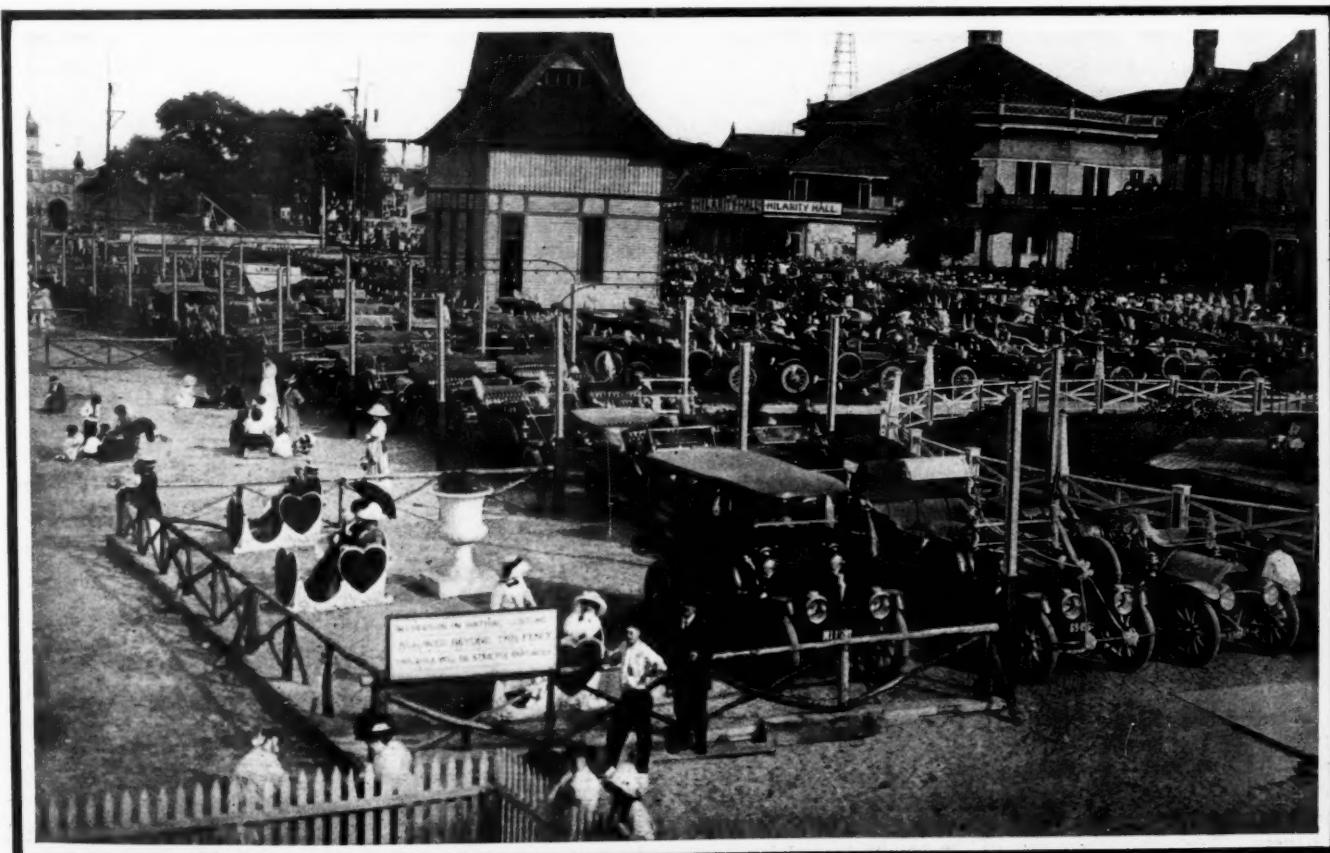
The bill has a clause limiting a patent right to 19 years exclusive of the time actually consumed in the patent office in considering it, or by the courts in deciding some phase of it. "This provision," says the report, "is aimed at the procrastination that has become proverbial on the part of applicants for patents."

The bill seeks to upset the present practice of considering as an infringement of a patent any sale of any patented article below price fixed by the manufacturer. For instance, many well known articles of everyday use, particularly in the motor car accessory trade, have the same retail price the world over. This is a matter controlled by the manufacturer and any cut-rate sale is liable to a suit in the United States courts on the ground that it is an infringement. The bill would make it not a matter of suit on the patent, but simply a matter of contract with manufacturer and dealer.

Rochester Orphans Enjoy Outing

ROCHESTER, N. Y., Aug. 10—Rochester's annual orphans' day held last Tuesday was a great success, 762 orphans being driven in 284 automobiles to Ontario Beach Park where the parentless children had access to every amusement on the grounds.

Headed by the automobile owned by President C. J. Brown, of the Rochester Automobile Club, in which were seated Mayor Edgerton, of Rochester; his secretary, Bernard J. Haggerty, and Commissioner of Public Works Herbert W. Pierce, the procession of automobiles started at 1 o'clock and paraded through the prominent streets of this city to Ontario Beach. After the many children were unloaded from the machines at the amusement resort, the automobiles were parked along the lake shore extending along Ontario Park beach and beside the grandstand. The procession returned with their occupants at 5 o'clock to the various institutions where the orphans are confined.



Scene at Ontario Beach Park, where the orphans of Rochester, N. Y., were entertained by the Rochester Automobile Club

Trade News of the Week

Detroit Factories Planning to Ship 330,000 Automobiles During the Coming Trade Year

Philadelphian to Make Wire Wheels Under Rudge-Witworth Patent—Rubber Lower Than Last Year

DETROIT, MICH., Aug. 12—To formulate plans for furnishing all the railroad cars which will be necessary for the handling of the 1913 shipments of automobiles from this territory, a conference was held on August 7 at the Board of Commerce between that organization's traffic bureau and local automobile factory representatives.

Detroit motor car manufacturers will require 102,000 freight cars for the shipment of their 1913 output. On this basis the above figures mean that Detroit's contribution to the automobile world for the coming season will be about 330,000 automobiles.

The problem faced by the railroads, manufacturers and the traffic bureau is to determine the best manner in which to get the necessary freight cars into Detroit for transporting the motor cars to their destinations and for returning them for reloading.

The conference was attended by a number of railroad officials in addition to the motor car men. Harry Moule, chairman of the Detroit committee of the National Association of Automobile Manufacturers, presided, while the Board of Commerce traffic bureau was represented by A. T. Waterfall. Representatives of the following automobile concerns were present: Abbott, Anderson, Buick, Chalmers, Cadillac, Ford, General Motors, Hupp, Hudson, Krit, Lozier, Oakland, Packard, R-C-H, Reo, Regal and Willys-Overland.

Lloyd with International Motor

R. M. Lloyd, who has been vice-president of the General Vehicle Company for several years, resigned recently from that corporation to take a position as assistant to the president of the International Motor Company, manufacturers of the Saurer, Hewitt and Mack trucks.

Formal announcement of the change was not made until after it had taken place and Mr. Lloyd had been installed in his new work. No announcement has been made by President Coleman, of the International, or President Wagoner, of the General Vehicle Company, as to the significance of the move.

Van Sicklen Goes to Motor Field

N. H. Van Sicklen, Jr., who for the past year has been associated with the Class Journal Company as office manager, and for 8 years previously occupied a similar position with *Motor Age*, has bought an interest in the Wahlgreen Publishing Company, Denver, Col., publishers of *Motor Field*. Mr. Van Sicklen takes to his new venture the well wishes of the hosts of friends he has made during his long experience in the automobile publication field.

To Make English Wire Wheels Here

PHILADELPHIA, PA., Aug. 13—The Geo. W. Houk Company, of this city, which has the American rights for manufacturing the Rudge-Whitworth detachable wire wheels, an English invention, has completed arrangements with the Standard Roller Bearing Company, of this city, for the manufacture of these wheels for the American trade. The Standard company at its plant in this city has sufficient manufacturing space available and is already engaged in equipping it with the necessary machinery for the

manufacture of the wheels. It is expected that the manufacturing will begin in 30 days. Reports are to the effect that several of the large car manufacturers have already blue prints completed and are showing specifications and requirements for hub constructions for their particular cars.

Edwards to Locate on Long Island

Official announcement has been made that the Edwards Motor Car Company will be located in the plant formerly used by the United States Metal Products Company at Long Island City for at least 1 year.

With regard to the establishment of a big assembling plant for trucks at Louisville, an option has been secured for such an undertaking, but whether it will be exercised depends largely upon the success that attends the financial negotiations now in progress with local Louisville capitalists.

Rubber Lower than Last Year

LONDON, Aug. 13—The volume of plantation rubber offerings at the fortnightly auctions so far this year have been nearly 10,000 tons against about 5,500 tons during the corresponding period of 1911. The auction that began today will dispose of about 750 tons, although the exact amount cannot be known until the sale is concluded. Two large consignments are due to arrive before the sale is finished. Prices secured have averaged lower than last year, the present level being almost 8d. lower per pound. The mystifying quietude of the market for Para continues and there is an undertone of strength in the trading that would not seem to be warranted by the volume of general buying. Those

Automobile Securities Quotations

There was a more active market for automobile securities during the past week. The movements were irregular, but in the main they were upward. The most notable advance in quotations was that of Ajax-Grieb common, which was moved up to 150 bid with sellers at 200. The trading was exceedingly light as holders stiffened measurably when the bids went up. United States Motor Company had a lively action in both issues. Reorganization rumors which included revival of the talk that a merger with Studebaker had been concluded led to sharp buying that drove the preferred above 20. This was officially denied and the real reason for the rise is the probability of a favorable reorganization based upon the company's own resources. Goodrich was easier in tone. A comparison with last year:

	Bid 1911	Asked 1911	Bid 1912	Asked 1912
Ajax-Grieb Rubber Co., common.....	..	150	200	
Ajax-Grieb Rubber Co., pfd.....	..	95	100	
Aluminum Castings, preferred.....	..	..	..
American Locomotive, common.....	38	38 1/4	99	102
American Locomotive, preferred.....	106	107	44 1/2	45 1/2
Chalmers Motor Company.....	..	..	145	155
Consolidated R. T. Co., common.....	5	10	13	16
Consolidated R. T. Co., preferred.....	10	20	50	59
Diamond Rubber Company.....	..	..	..
Firestone Tire & Rubber Co., com.....	160	170	273	276
Firestone Tire & Rubber Co., pfd.....	105	107	106 1/4	..
Garford Company, preferred.....	..	..	99	101
General Motors Company, common.....	51 1/2	52	35	37
General Motors Company, preferred.....	86	87	78	79
B. F. Goodrich Co., common.....	..	..	72 1/2	73
B. F. Goodrich Co., preferred.....	..	..	107 1/4	108
Goodyear Tire & Rubber Co., com.....	230	240	330	334
Goodyear Tire & Rubber Co., pfd.....	105	107	104 1/4	105 1/4
Hayes Manufacturing Company.....	..	..	..	97
International Motor Co., com.....	..	..	27 1/2	28 1/2
International Motor Co., pfd.....	..	..	84	85
Lozier Motor Company.....	..	..	50	60
Miller Rubber Company.....	..	..	..	146
Packard Motor Company, preferred.....	..	..	105	107
Peerless Motor Company.....	..	..	120	
Pope Manufacturing Co., common.....	48	52	37	40
Pope Manufacturing Co., preferred.....	78	80	74	75
Reo Motor Truck Company.....	8 1/2	10	9 3/4	10 1/2
Reo Motor Car Company.....	23	25	21	24
Studebaker Company, common.....	..	..	44	45
Studebaker Company, preferred.....	..	..	97	99
Swinehart Tire Company.....	..	..	95	97
Rubber Goods Company, common.....	..	..	100	
Rubber Goods Company, preferred.....	..	..	107	110
U. S. Motor Company, common.....	39	40	4 1/2	5 1/2
U. S. Motor Company, preferred.....	79	80	19	20
White Company, preferred.....	..	..	107 1/2	..

who are marketwise have scented another plan of valorization and as partial confirmation of their suspicions it has been rumored that 2,400 tons of Para have been quietly purchased and retired from the market. The market stands at \$1.17 per pound for up-river fine Para with other grades of rubber on a corresponding basis.

Steel Bars Sold at Premium

The market for structural steel and soft steel bars has been enlivened recently by the placing of orders for 10,000 tons of the latter commodity by manufacturers of automobiles, mostly located at Detroit. The order in itself is not of remarkable size for this period of the year, but it was placed at premiums running from \$1 to \$5 a ton and was conditioned upon definite delivery dates.

Most of the steel involved in the automobile orders will be specially treated and much of it will be alloyed before it finds its way into the product of the factories.

Jewel Merged in Ohio Company

COLUMBUS, O., Aug. 12—The Secretary of State of Ohio has authorized the amalgamation of the Jewel Carriage Company and the Ohio Motor Car Company, both of Cincinnati. Heretofore the Ohio car was manufactured and sold through the Jewel Carriage Company, but by the change the Jewel Carriage Company will forever lose its identity and the business will be carried on by the Ohio Motor Car Company, the carriage end of the business having been sold to the American Carriage Company, of Cincinnati, several months ago.

Market Changes for the Week

Tin was the most prominent feature of the metal market this week, in that renewed activity in this material raised the price 45 cents per 100 pounds. Fractional gains were also scored by both electrolytic and Lake Superior copper, which were accompanied by a somewhat firmer tone of dealing than was witnessed in the preceding weeks. The steady, fractional rise in antimony which evidenced itself during the past 3 months was continued when on Saturday the price rose to 7 5-8 cents a pound. Steel quotations remained unchanged, and the condition in such products as channel steel, where producers found no bids on their wares, continues from last week. Lead remained unchanged.

Oil and lubricants remained at their old prices, with the exception of cottonseed oil, the latter declining owing to speculative influences. Gasoline also remained unchanged. Fine up-river Para rubber rose 1 cent a pound during the week, closing firm at \$1.17. The variations for the week follow:

Material	Wed.	Thurs.	Fri.	Sat.	Mon.	Tues.	Week's Change
Antimony, lb....	.07 1/4	.07 1/4	.07 1/4	.07 1/4	.07 1/4	.07 1/4	+.00 1/4
Beams & Channels, 100 lbs.....							
Bessemer Steel, Pittsburgh, ton...21.50	21.50	21.50	21.50	21.50	21.50	21.50	
Copper, Elec., lb...17 1/2	17 1/2	17 1/2	17 1/2	17 1/2	17 1/2	17 1/2	+.00 1/2
Copper, Lake, lb...17 1/4	17 1/4	17 1/4	17 1/4	17 1/4	17 1/4	17 1/4	+.00 1/4
Cottonseed Oil,							
Cyanide Potash, lb...19	19	19	19	19	19	19	
August, bbl....6.49	6.41	6.38	6.35	6.15	6.33	—.16	
Fish Oil (Men- haden).....33	33	33	33	33	33	33	
Gasoline, Auto, 200 gals. @....21	.21	.21	.21	.21	.21	.21	
Lard Oil, prime...85	.85	.85	.85	.85	.85	.85	
Lead, 100 lbs....4.50	4.50	4.50	4.50	4.50	4.50	4.50	
Linseed Oil.....70	.70	.70	.70	.70	.70	.70	
Open-Hearth Steel, ton....22.00	22.00	22.00	22.00	22.00	22.00	22.00	
Petroleum, bbl., Kansas crude...70	.70	.70	.70	.70	.70	.70	
Petroleum, bbl., Pa., crude....1.60	1.60	1.60	1.60	1.60	1.60	1.60	
Rapeseed Oil, refined.....68	.68	.68	.68	.68	.68	.68	
Rubber, Fine Up- river Para.....1.16	1.16	1.17	1.17	1.17	1.17	1.17	+.01
Silk, raw Ital....4.15	4.15	4.15	4.15	4.15	4.15	4.15	
Silk, raw Japan....3.67 1/2	3.67 1/2	3.67 1/2	3.67 1/2	3.67 1/2	3.67 1/2	3.67 1/2	
Sulphuric Acid, 60 Beaumé....99	.99	.99	.99	.99	.99	.99	
Tin, 100 lbs....45.25	45.25	45.25	45.25	45.75	45.70	45.70	+.45
Tire Scrap.....09	.09	.09	.09	.09	.09	.09	

Atlas Plant Not Yet Sold.

Prospective Purchasers Cannot Agree on Bid—Detroit Capitalists Abandon Idea of Taking Over Works

Havers Company Acquires Former E-M-F Plant—Market Changes for the Week

INDIANAPOLIS, IND., Aug. 12—Although today was fixed for the sale of the Atlas Engine Works plant and property, Fred C. Gardner, receiver for the company, had no report to make to the court. Judge Clarence Weir is out of the city, but it is understood that upon his return the time for making the sale will be extended.

M. L. Thomsen, of Cleveland, who some time ago said a company of Eastern capitalists would submit a bid, sent a telegram saying the men with whom he was associated had been unable to agree on the matter of making a bid. Detroit capitalists, who were said to have been headed by Walter E. Flanders, and who were expected to bid, have withdrawn as prospective bidders. It is reported the men who expected to be interested in this deal have also disagreed.

It is reported there are other prospective bidders in sight, but their identity is not being made public at this time. The proposition is a large one to handle, including assuming bonds for \$1,050,000 secured by a mortgage; another bond issue of \$105,000 and receivership expenses and mercantile accounts aggregating about \$80,000.

[Percy Martin, head of the British Daimler and Birmingham Small Arms companies of England, is in the United States on a visit that is scheduled to cover 6 weeks or more. Mr. Martin spent several days in New York, inspecting the Maxwell plant and conferring with various automobile interests and then went West, partly on a personal mission.

He is a native American and his present visit to this country is the first he has made in many years. His presence here has caused much speculation among the trade as to its reasons, as he is the leading exponent in England of the Knight motor and appears upon the scene at the time the affairs of the Atlas Engine Works of Indianapolis are in a much tangled condition. He has been in consultation with W. E. Strong, chairman of the Board of Directors of the United States Motor Company and accompanied Mr. Strong on a visit to Detroit last week for the purpose of inspecting the automobile field there.]

Havers Purchases E-M-F Plant

PORT HURON, MICH., Aug. 12—The Havers Motor Car Company has purchased the E-M-F plant in the north end from the Studebakers and will manufacture from 1,200 to 1,500 cars in 1913. The E-M-F will begin at once the removal to Detroit and the Havers people expect to be able to occupy the local plant by September 1. The purchase price is not made public and the machinery of the E-M-F, with the exception of some of the shafting, was not included in the deal. The Havers now employs between sixty and seventy men. With the new facilities the number of employees will be greatly increased. Last year the company was able to turn out only 200 cars. That the plans for 1913 call for at least six times that number shows what the move will mean to this city.

The Havers company is a local concern with the following officers: President, A. D. Bennett; vice-president, H. L. Stevens; secretary-treasurer, A. J. Murphy; directors, David McMorran, S. L. Boyce, Edmund Harrington and Phil Higer. The company was one of the pioneers in the manufacture of six-cylinder cars and will continue the manufacture of this type.



Cars well bunched in the 75-mile race on the first day of the Galveston Beach meet

Disbrow Galveston Star

Captures 50-, 75- and 200-Mile Events With Simplex and Mercedes—Mason Second in Big Race

Mason, Case and National Feature in the Shorter Events. Each Winning Two

GALVESTON, TEX., Aug. 10—Signal success and big crowds marked the fourth annual automobile meet which came to a close here today. It was conducted, like its predecessors, under the auspices of the Galveston Racing Association and as one of the attractions of the Galveston Cotton Carnival.

The Galveston beach course is on the gulf side of the island. It is a straight and ideal stretch of 2 1-2 miles, and according to the statements of experienced drivers it has no superior in the country. The turns are all that could be desired. The fact that the hard sand beach is subjected to tidal inundation keeps it packed and smooth. The course is so laid out that the cars pass the grandstand twice in making each lap. The grandstand itself is a new structure with a seating capacity of 10,000 people. It was comfortably filled on each of the 3 days and besides this crowd tens of thousands of spectators viewed the racing from the open space along the course.

The entrants to the different events and classes numbered seventy-three, but a number of these failed to start.

The program for the 3 days was made up of ten events. F. E. Edwards, chairman of the technical committee of the A. A. A., besides performing the work of inspecting the mechanism of the different cars and putting his official stamp of approval upon the entries and classes, also had charge of the electrical timing machine. The referee was Mayor Lewis Fisher, of Galveston.

FIRST DAY

The program of the first day was made up of five events. Interest was centered in the last one on the list, a 75-mile race open to Class E (non-stock) cars of 600 cubic inches displacement and under. Louis A. Disbrow, driving his Simplex "Zip," easily took first money in this event. He started at a clip that quickly placed him in the lead and during the entire 75 miles he retained first position, but was closely pressed at different times by Clark, driving the Mercedes, the latter coming in a close second and never once losing its position next to the winning car. Disbrow also took second money in the second race, driving the Case White Streak. These two successes made him the hero

of the day in the eyes of the spectators who applauded him every time he appeared on the course.

In the 75-mile race eleven cars were entered, but only five of the number completed the fifteen laps. As stated above, Disbrow, driving his Simplex Zip, won this event. His time was 1:09:16.72. The time of the Mercedes, Clark, which finished second, was 1:09:42.66. The Mason special, driven by Endicott, was third, in 1:12:16. The Case White Streak and the Mercer finished fourth and fifth, respectively. Summary of first day:

Class C, non-stock, division 3-C, 15 miles				
Car	Bore	Stroke	Driver	Time
Case Bullet	4 3-8	5	Nikrent	15:04.62
Case White Streak	4 3-8	5	Disbrow	15:05.00
Mercer	4 3-8	5	Ferguson	15:09.72
Class C, non-stock, division 2-C				
Car	Bore	Stroke	Driver	Time
Mason Special	3 13-16	5	Endicott	15:27.75
Flanders Special	4	4 1-2	Tower	15:57.55
Flanders Special	4	4 1-2	Evans	.16:09.89
Class C, non-stock, division 4-C, 20 miles				
Car	Bore	Stroke	Driver	Time
National	5	5 11-16	Plummer	20:05.00
Stutz	4 1-4	6 1-2	Stolz	22:01.36
National	5	5 11-16	Melaum	(Flagged off)
Class C, non-stock, division 1-C, 10 miles				
Car	Bore	Stroke	Driver	Time
Studebaker 20	3 5-8	3 3-4	Evans	11:07.09
Studebaker 20	3 5-8	3 3-4	Tower	11:11.91
Studebaker 20	3 5-8	3 3-4	Finch	(Distanced)
Class E, non-stock, 75 miles				
Car	Bore	Stroke	Driver	Time
Simplex	5	5 3-4	Disbrow	1:09:16.72
Mercedes	5	7 1-4	Clark	1:09:42.66
Mason Special	3 13-16	5	Endicott	1:12:16.92
Case White Streak	4 3-8	5	Ulbrecht	1:58:49.70
Mercer	4 3-8	5	Ferguson	2:00:20.00
National	5	5 11-16	Plummer	
Lozier	5 3-8	6	Horan	
Flanders Special	4	4 1-2	Evans	
Flanders Special	4	4 1-2	Tower	
Case Bullet	4 3-8	5	Nikrent	
National	5	5 11-16	Melaum	

SECOND DAY

GALVESTON, TEX., Aug. 10—There was a good program of events for the second day of the meet. The crowd was almost as large as on the opening day.

The Simplex "Zip" easily won first place in the Class D, free-for-all, covering the distance of 50 miles, well ahead of its nearest competitor on every lap. This event was the fourth on the second day's program. The time of Simplex "Zip" was 46:18.89. The other feature of this race was the unusually large field of entries. Seventeen cars lined up for the start. They filled the entire beach course from side to side. First money amounted to \$350. The second prize of \$100 went to the Mercedes, entrant, W. H. Bertrand, driver, Clark. This car showed better speed in the second day's events than in those of the opening day, due to the fact that its gauge had been readjusted. The third place in this event was won by the Case Bullet, entrant and driver, Joe Nikrent. The prize for third place was \$50. The Case special, J. A. Sloan, entrant, and B. Endicott, driver, came in fourth in this race.

In the 75-mile race Mr. Wagner disqualified driver Stoltz for cutting across the course with his car, Stutz, which was entered by A. C. Bering. The second day's summaries follow:

Class E, non-stock, special, 25 miles			
Car	Bore	Stroke	Driver
Mason Special	3 13/16	5	Endicott
Flanders Special	4	4 1/2	Evans
Flanders Special	4	4 1/2	Tower
Class E, special, 25 miles			
National	5	5 11/16	Plummer
Case White Streak	4 3/8	5	Disbrow
Case Bullet	4 3/8	5	Nikrent
National	5	5 11/16	Melaun
Studebaker 20	3 3/8	3 3/4	Christie
Case Special	4 3/8	5 1/2	Perry
Mercer	4 3/8	5	Ferguson
Stutz	4 1/4	6 1/2	Stoltz
			Failed to finish
			" "
Class E, non-stock, special, 25 miles			
Case Bullet	4 3/8	5	Nikrent
Case White Streak	4 3/8	5	Disbrow
Studebaker 20	3 3/8	3 3/4	Christie
Mason Special	3 13/16	5	Endicott
Class D, free-for-all, 50 miles			
Simplex "Zip"	5	5 3/4	Disbrow
Mercedes	5	7 1/4	Clark
Case Bullet	4 3/8	5	Nikrent
Case Special	4 3/8	5 1/2	B. Endicott
National	5	5 11/16	Melaun
Studebaker 20	3 3/8	3 3/4	Christie
Case White Streak	4 3/8	5	Ulbrecht
Simplex	6 1/10	5 3/4	Pringle
National	5	5 11/16	Plummer
Studebaker	3 3/8	3 3/4	Finch
Flanders Special	4	4 1/2	Tower
Flanders Special	4	4 1/2	Evans
Mason Special	3 11/16	5	H. Endicott
Fiat	5 1/8	7 3/4	De Palma
Lozier	5 1/8	6	Horan
Buick	5	5 11/16	Robetries
Stutz	4 1/4	6 1/2	Stoltz
			Failed to finish
			" "

THIRD DAY.

GALVESTON, TEX., Aug. 10—There was much interest manifested in the effort to break the mile record, which was 37.8 seconds, made last season. This event came last on the day's program and it was well after darkness had begun to settle down that Disbrow in his Jay-Eye-See covered the mile in 31 11-100 seconds.

The 200-mile race was not without its thrilling incidents. The odds. In the 200-mile race the Simplex Zip, Disbrow, driver, quickly caught the lead and it maintained it with varying regularity the 100th mile. All during the race the closest competitor of the Simplex was the Mason special, H. Endicott entrant and driver. This car made 180 miles before visiting the pit for gasoline or other purpose.

Class D, free-for-all, 200 miles			
Car	Bore	Stroke	Driver
Simplex "Zip"	5	5 3/4	Disbrow
Mason Special	3 13/16	5	H. Endicott
Mercedes	5	7 1/4	Clark
Flanders Special	4	4 1/2	Evans
National	5	5 11/16	Plummer
Case Special	4 1/8	5 1/2	B. Endicott (Failed to Finish)
Studebaker 20	3 5/8	3 3/4	Christie
Flanders Special	4	4 1/2	Tower
Stutz	4 1/4	6 1/2	Stoltz
Case White Streak	4 3/8	5	Ulbrecht
Fiat	5 1/8	7 3/4	J. De Palma
National	5	5 11/16	Perry
Case Bullet	4 3/8	5	Nikrent
Studebaker 20	3 5/8	3 3/4	Finch

Class E, non-stock, flying start, for beach record of 1 mile
Jay Eye See..... 9 1/4 8 5/8 Disbrow ...31 seconds

Boillot Wins at Ventoux

Grand Prix Victor Not Only Annexes The Honors, But Breaks the Record as Well

Covers the 13-Mile Course in 17.46, Lowering the Previous Best By 55 Seconds

A GARENNE COLOMBES, FRANCE, Aug. 12—(Special Cable to THE AUTOMOBILE)—The Mont Ventoux hill climb has added another triumph to those already accumulated by the winner of the French Grand Prix, Boillot, with a Peugeot car again proving the winning combination and incidentally breaking the record for the hill climb.

The times made by the competitors were as follows:

UNLIMITED CLASS

Car	Driver	Time
Peugeot	Boillot	17.46
Cottin-Desgouttes	Deydier	18.38
Benz	Demoraes	18.49
Bugatti	Bugatti	19.16
Excelsior	Christaens	19.34
Lion-Peugeot	Thomas	21.14
Fiat	Tongazzi	21.51
Hispano-Suiza	Grua	22.50

TOURING CLASS

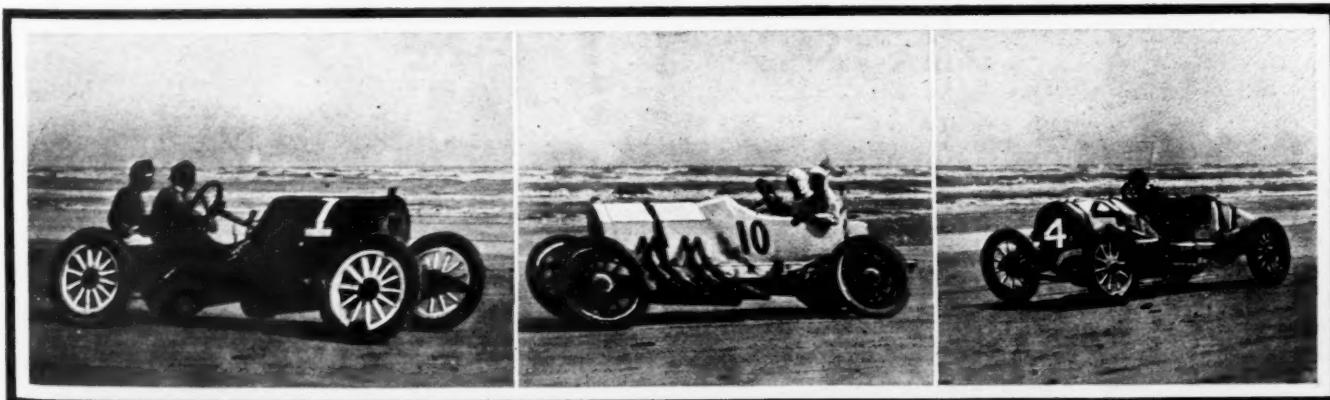
Cottin-Desgouttes	Pox	24.35
Schneider	Juvanon	28.11
Cid, Valveless	Naas	34.15
Cid	Thivolle	34.31
Cid	Robert	38.27
Apollo	Tonndorf	42.35

Mont Ventoux stands out as the oldest, the most important and the most difficult hill climb in France. With a total length of a fraction over 13 miles, its maximum percentage is 13 over the last few hundred yards, and after the first few hundred yards it rarely drops below 8 per cent. The percentage at distances of 5 kilometers are as follows:

5 kilometers	5.7 per cent.
10 kilometers	9 per cent.
15 kilometers	8.2 per cent.
20 kilometers	8.1 per cent.
21.6 kilometers (finish)	13 per cent.

Since 1909 the record for the hill has been held by Bablot, who on the Grand Prix Brasier driven by Thery at Dieppe the previous year climbed the hill in 18 minutes 41 seconds. This year's climb was rendered more interesting than usual by the presence of Boillot with the Peugeot racer.

CLEVELAND, O., Aug. 12—The clipping of 4 seconds from the 1-mile dirt track record for Cleveland made 3 years ago by Barney Oldfield on the old Glenville track, was the sum total of achievement at the all star meet promoted by the Burman-Moross bunch of barnstormers Wednesday, August 7, as a feature of the Eagle's convention.



Simplex "Zip," driven by Desbrow

Mercedes, driven by Clark

Case White Streak, Disbrow driving



Sentry box equipped with telephone for use of members of British Automobile Club

Patrols for Motor Tourists

How the British Automobile Association Safeguards Traveling Over Highways—Roadside Phones Insure Prompt Assistance—Equipped for First-Aid Work



Patrolman

NOVEL and interesting to the American automobile tourist is the system of road patrols, road guides and wayside telephones in common use throughout Great Britain. The commencement of the present nation-wide institution was the movement initiated by the Automobile Association in 1905, when a few patrolmen were commissioned to travel over certain well-patronized sections of the highways to give aid of whatever nature to members of the association who desired it.

These patrols were prepared to give information with regard to roads and routes; to assist in making temporary repairs when required; to direct the inquiring member to the nearest garage, hotel or supply depot and to perform any other services that appeared to be necessary.

As the association grew, the system was extended until at present, the membership of the organization is nearly 49,000 and the patrol system covers 14,000 miles of highway.

By the last of August the roadside telephone system will be completed and at the service of the members. By means of this system of communication it will be possible for the automobile tourist who is affiliated with the association to get into close touch with garages, hotels and all points reached

by the regular system. In case of mishap it will be possible for the tourist to communicate with home, friends or office from any of the patrol boxes of the association. These boxes are erected every 10 miles on the main roads radiating from all the chief cities.

Quick Relief When in Trouble

A telephone communicating with the nearest exchange is installed in each box. The telephones are at the service of members for all purposes, business or private use, breakdown or accident, entirely free of cost. Only in case of trunk-line calls is a tariff levied and it is never higher than the ordinary trunk-line fee. Each sentry box is available, both for local and trunk calls and for receiving, as well as transmitting messages. A patrol is on point duty at each box. Thus is the aim of the



Association badge





Patrol discovers automobilist in trouble and hastens to nearest sentry box to bring assistance

committee being realized, which is to give the motorist a practical organization, affording him practical help in a business-like way; giving him free legal defense in any proceedings under the Motor Car Act; ensuring the comfort of members while on tour; supplying facilities for repairs during any hour, day or night, week days and Sundays; making easy the obtaining of spare parts; extending international touring facilities and engineering advice; maintaining patrols on all main roads; and extending first aid and prompt assistance in the event of accident or breakdown.

The Royal Automobile Club, realizing the value of some such system of road patrol, has installed a somewhat similar idea. The patrols are called guides and are instructed to give road information and to assist any member of the organization in any way possible in case of need.

Signals to Cars in Motion

Developments of the patrol idea are coming along with much speed and frequency. At present a system of whistle signals is being worked out so that the patrolman will be able to give certain information to the operators of automobiles after they have passed. Semi-deflated tires can be called to the attention of the driver by a certain signal; a loose license plate will be indicated by another; smoke in undue volume will be noticed with still another series of whistles.

Under present conditions the patrols have no way of communicating these facts to the driver unless the car is stopped, because if it continues on its way, the patrol realizes the conditions after the car has passed and it is then too late to stop it except in rare cases.

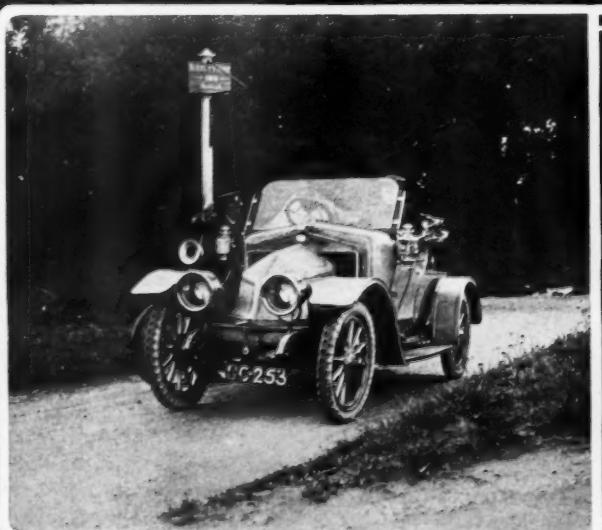
The character of the patrolmen has improved remarkably with the growth of the movement. Today, in order to hold such a post for the Automobile Association it is required that the man shall have a general knowledge of First Aid work and practice in case of mishaps; that he must have a good working knowledge of automobile repairs, maintenance and mechanism, and that he shall be energetic and observant as well as industrious and discriminating. He must be well up on road geography and capable of imparting information in an intelligent manner.

High-Price Gasoline in England

In discussing the recent boost in gasoline in England, where motorists now have to pay 32 cents a gallon for the fuel, R. M. Lockwood, head of the Regal Motor Car Company's foreign department, says: "The difficulties which the motorists of England face should make us thankful for two things. First, that the price of gasoline here is, in comparison, much lower, and second, that the industry in this country has advanced to the stage where we are producing cars that are actually economical in gasoline consumption.

"In America we do not always appreciate the fact that we pay a very low price for this necessity. In parts of Europe and certain localities in the Orient I have known the price to be as high as 60 cents a gallon. Quite naturally, the figure varies according to the facilities for receiving the gasoline. Here, where we have apparently an inexhaustible supply and good means of transportation, the price of the fuel is correspondingly low.

"Furthermore, our cars in most instances develop more power in proportion to the amount of gasoline consumed than do the cars of Europe. The average European car may use less gasoline, but it cannot mount the hills as easily as our cars can. Europeans are preferring the cars we export because they give better service for the gasoline consumed than the ones manufactured in their own countries."



Patrol directing automobile party to the nearest sentry box, where they may telephone for assistance

**Ran out of fuel, patrol responds with gasoline
Patrol members must be adepts in first-aid service**



Data Relating to One of the Centrifugal Pumps for Fire Engines Made in Germany— How the Interests of the Automobile Industry and the General Public are Identified with Either Centrifugal or Rotary Gear Pumps—Miscellany

CENTRIFUGAL Fire Engine Pumps—Fire engines of a construction which any automobile or motor truck manufacturer may take up without interfering with the system and routine of his other production, which are economical and compact and require little more care at the fire station than an ordinary automobile; which, further, are of light weight and may be taken readily and rapidly over any passable road from one town or village to another, in case of unusual conflagrations, and which may be served in emergencies by crews whose physical skill in fire-fighting is undeveloped, naturally recommend themselves to the attention of the public and its representatives as well as to that of specialists in a country like the United States, where the automobile movement is more popular than in any other country, and where, on the other hand, the art of fire prevention is much more backward, so that the total fire losses in a year per capita of population is about five times greater than the international average.

But although the leading feature of such a construction is the use of a centrifugal pump driven direct from the automobile motor, and the construction of centrifugal pumps in general owes its development principally to the ingenuity of American inventors and the enterprise of American firms, it is Germany which has led and is still leading in the simplification and cheapening of fire-fighting apparatus attainable by the use of the centrifugal pump on an automobile chassis. Only the rotary gear pump of German invention (see illustrated description in *THE AUTOMOBILE* of July 11) competes with the centrifugal type for securing the advantages referred to, a comparison disclosing advantages and disadvantages on both sides. In various extracts from articles in German journals *THE AUTOMOBILE* has recently given some of the most interesting facts relating to the German development, and in the following some supplementary notes are presented from an article by Werner Ahrens, an engineer with the Sulzer firm at its Winterthür plant, relating mostly to the Sulzer multiple centrifugal pump.

In the use of the centrifugal pump the speed of the pump shaft is the factor by which efficiency is secured. This speed, it might be said, takes the place of the close fit of piston and the

alternating closing and opening of the valves in pumps with positive action. The maximum pressure which can possibly arise in the pipes and hose of a centrifugal pump is that determined by the maximum speed of the pump shaft. This is the same whether the hose nozzles are open or closed. To obtain efficiency without cumbersome special gearing it is necessary that the automobile motors used in fire engines of this type should be high-speed engines giving their best torque at more than 2,000 revolutions of the motor shaft, and this is the type of motors used. (The positive or almost positive rotary gear pump seems in this respect more adaptable to the slower-running automobile motors still prevailing in the United States, especially among motor truck makers.—Ed.) A multiple centrifugal pump of the Sulzer manufacture with three centrifugating

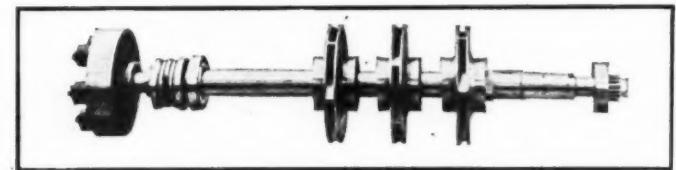


Fig. 2—The shaft and centrifugating wheels of the Sulzer pump

wheels fixed on the pump shaft is shown in Figs. 1, 2 and 3. Fig. 1 gives a sectional view of all but the evacuating pump (the exact construction of which does not seem to be made public anywhere, at present, perhaps because the liveliest competition among the various German pump makers bears upon improvement of this detail by which the advantages of the rotary gear pump are sought to be equalled). Fig. 2 shows the pump shaft and the centrifugating wheels on it, and Fig. 3 shows the dismounted parts of the complete pump in their sequence and to the right thereof the complete pump assembled. Each centrifugating wheel rotates within a stationary housing with circumferential discharge ports and separated from the housing of the next wheel by a baffle plate compelling the water thrown out of the first housing to enter the next wheel near its center.

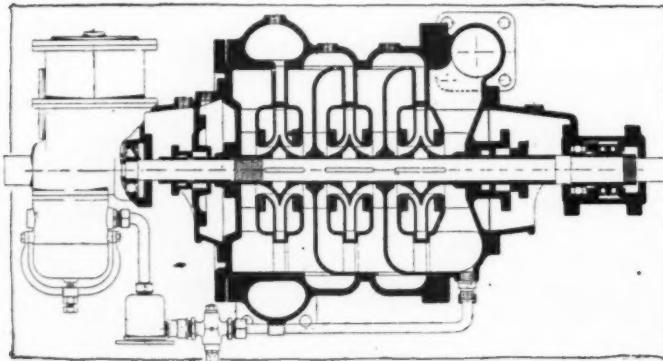


Fig. 1—Sectional view of Sulzer triple centrifugal pump with air-exhausting attachment

WATER ENTERS WHEELS ON BOTH SIDES

Provided the dimensions of the working parts and the speed of the shaft are properly suited to the quantity of water handled and the available power, the pressure created by the first wheel is doubled by the next wheel and tripled by the third. The capacity and the required power are proportionate to the square roots of the pressures. To obviate end-pressure on the ball bearings the water is made to enter into the centrifugating wheels on both sides. The evacuation pump is built in one with the centrifugal pumps, so that the whole pump plant may be mounted in the automobile chassis as a unit. It is of the reciprocating piston type and is built so as to operate not only as an air pump to evacuate the suction hose, but also as a water pump which may be left going in conjunction with the centrifugating pump. In other constructions the evacuation pump

operates as air pump only, and a device is necessary for automatically closing it against the entrance of water. The illustrations show the pipe by which the evacuation pump is connected with the suction room of the centrifugal pump. When the stopcock on this pipe is closed the evacuation pump runs idle, as may be desirable when the whole pump is operating with the assistance of a considerable waterworks pressure.

As a flexible coupling is effected by merely shoving the pump shaft against the end of the transmission shaft, the mounting of a centrifugal pump consists merely in bolting it to the automobile chassis, and small misalignments are unimportant as the method of coupling admits of them. There is therefore an advantageous independence between the work of the automobile manufacturer and that of the pump maker.

By allowing the evacuation pump to be operated concurrently with the centrifugal pump, a special gear shift for the small pump is dispensed with and the service is simplified. But the principal advantage of this arrangement lies in the complete reliability of the pumping action which is gained as the evacuation pump disposes of all the air which may be, and nearly always is, present in the suction hose. For example, when the hose is carried over walls or other obstructions, air pockets are nearly always formed. And when the suction hose is disconnected in order to be attached to a new water source, air pockets are formed unless the valves and the hose itself are perfectly watertight. With the evacuation pump permanently attached—and working with either air or water—only 30 to 60 seconds are required for the evacuation of the air from the suction conduit when the engine arrives at a fire.

PUMP PERFORMANCE CAN BE REGULATED

All organs of the pump are made of bronze excepting the shaft and the ball bearings, and the weight of a complete pumping plant with evacuation attachment and dimensioned for a pressure of 100 meters and a capacity of 1,000 liters per minute by a power output of 32 horsepower, reaches only 330 kilograms, while one throwing 2,000 liters per minute with 80 meters pressure by means of 50 horsepower weighs 450 kilograms.

A comparison of working pressures and the amount of water ejected with the power efficiency attained at test performances shows that even without varying the number of revolutions of the pump shaft a considerable regulation of the pump performance can be effected. When, for example, the discharge is regulated from 15 liters per second to 30 liters per second at 1,600 revolutions per minute of the pump shaft and a power output of 70 horsepower, the manometer pressure is at the same time reduced from 115 meters to 85 meters.

When the number of revolutions is changed, similar variations may be obtained with each of the shaft speeds. A small change in the speed makes a considerable variation in the work results as the pressures vary with the squares of the number of revolutions, and this makes it possible to suit widely varying requirements with a small variety of pump models. But in order to select the most suitable model it is of advantage to take into consideration the waterwork pressure which is locally available.

Diagrams published by Mr. Ahrend show that the water throw realized at an angle of 50 degrees reached from 16 to 20 meters in height and from 31 to 41 meters in distance by means of pressures of 6, 8, 10 and 12 atmospheres, 10 atmospheres corresponding to about 100 meters manometer pressure, and that at a nozzle angle of 32 degrees the distances were raised from 44 to 56 meters.—From *Zeitschrift des Mittel-europäische Motorwagen Vereins*, medio July.

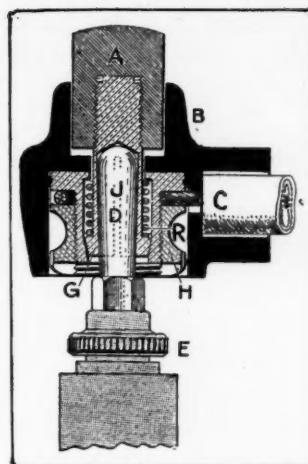


Fig. 4—Sectional view of Serfix device

To Secure Wires—Serfix is a neat little device whose mission is to hold ignition wires to spark-plugs without chance of accidental loosening and with some measure of protection against short-circuiting by rain. The connection is not inconveniently rigid, however, as the device may rotate a little around the terminal. The latter is shaped as a baseball bat and is inserted in the lower split and hollow part of a bolt G, whose upper part is screwed into the knob A made of insulating material. The lower end of this bolt G is conical and an interior conical surface on the surrounding metallic piece, which is not designated by any reference letter in the illustration, Fig. 4, is drawn against the conical part of G by means of the interposed spring R, thereby pressing G against the conical surface of the terminal D. The dotted lines marked J indicate the split. The wire is passed around the shank of the exterior piece and is held against its upper flange by the nut H. All the parts are inclosed in the cap B made of insulating material. In order to release the terminal from the wire it is necessary to press down upon cap B disengaging the two conical surfaces and while doing so to pull up at A.—From *Omnia*, July 27.

The Colors of Cars—Harmony in the colorings of a car, and of any other large object, is restful, while discord brings about an indefinite sense of fatigue and displeasure. This well-known fact has given rise to theories by which the phenomenon is explained in a rational manner in accordance with the known laws of optics and light, and by the aid of which it may, in turn, become easier to avoid discordant colorings in the products of industry. This subject is treated by A. Rosenstiehl in the March bulletin of the Industrial Society of Mulhouse. Differently colored light rays do not come to a focus at the same angle of refraction when passing into the human eye or through any other refracting medium. This is established. It follows from this that if the eye shall see clearly a surface upon which several colorings are spread side by side it must accommodate itself at the same time to different distances, and this is fatiguing if the effort is made, while otherwise the impression is blurred and

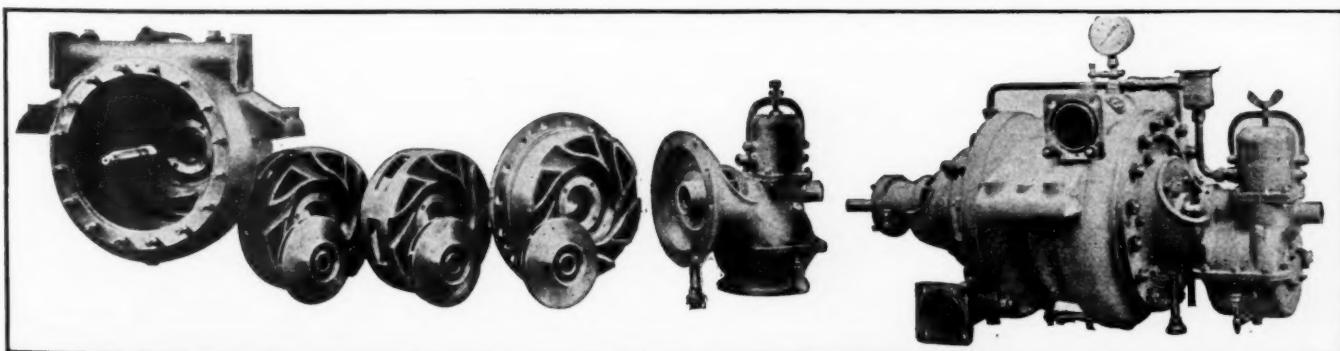


Fig. 3—Parts of the Sulzer centrifugal pump dismounted and shown in sequence. To the right, complete pump assembled

indistinct. It is also this difference in the refraction angles of the different colors which causes some colors to seem to recede and others to spring into relief. Red especially is a receding color. A red object seems farther away than a blue object placed in the same light and the same plane. In devising a color scheme it is important to avoid the clashes referred to, and this may be done by separating two sharply complementary colors by a neutral one whose angle of refraction lies between those of the two other ones and, especially, by adding white to at least one of two sharp colors. The author counsels particularly the latter method, which, according to his theory—presumably verified by experience—should render it practicable to obtain strong and yet not tiresome color effects without relying upon the artistic sensibilities of designers and workmen.—From *La Génie Civil* of July 13.

Stereoscopic Microscope—All who have occasion for examining polished and etched specimens of steel through an ordinary microscope with a single optic have experienced some difficulty in distinguishing the raised from the sunken parts. The image lacks perspective, and the expedient of rocking the microscope so as to make the shadows move and thereby indicate the formation is a makeshift which it is not always easy to apply. Only a partial relief from this difficulty has been offered through the binocular stereoscopic microscopes which so far have been in the market. They are constructed with two objective lenses and can therefore not be brought close to the object, and consequently the magnification is comparatively small, in fact limited to 80 diameters. They also fatigue the eye by inducing an effort for seeing the two images as one, especially when the observer is near-sighted, far-sighted or has eyes of different foci. A new construction has now been devised by Dr. Quidor, and it is manufactured by Nachet. In it a single objective is used and magnifications up to 400 diameters can be obtained. The light rays passing from the object through the objective lens are divided into two symmetrical bundles by means of two pairs of prisms and the observer perceives the perspective through the fusion of the two images. As in all other stereoscopic instruments the distance between the two oculars must correspond closely to the distance between the observer's eyes, but this adjustment is easily effected by rotation of one of the pairs of prisms. All fatigue of the eyes is said to be avoided. The advantages of the new construction were laid before the *Académie des Sciences* at its session of July 1.—From *Le Génie Civil*, July 13.

Aluminum Coat on Iron—A coat of lasting qualities can be produced by dipping an iron article in molten aluminum if the iron article is first dipped in alcohol so much diluted as not to be ignitable. Franz Jordan, of Berlin, has German patent on the process and kindred processes for aluminum-plating sheet iron by dipping and fixing the coat by reheating and rolling.—From *Metallurgie*, July 22.

Harking Back a Decade

What the Motoring Publications of 10 Years Ago Had to Say on Live Matters of the Day

FROM *The Automobile and Motor Review*, August 16, 1902:

With a few exceptions, the business vehicles, power-driven, are electrically propelled, so far as New York City is concerned.

A special motor wagon for the delivery of mail on a rural free delivery route has been constructed after designs of George E. De Groot, a letter carrier of Morristown, N. J. The body of the wagon is divided into two parts, the front for the driver and the rear for the postman. The driver can not get out after he is once inside unless released by the carrier. The car is equipped with a 20-horsepower gasoline motor.

The automobile industry in Berlin gave employment to 1,000 men during 1901 and is growing steadily. So far, the patrons of the industry who can afford to pay from 8,000 to 10,000 marks for a car prefer to purchase outside of Germany.

The official tabulation of the recent Paris-Vienna race has been completed, involving the consideration of 16,000 sets of figures. The final result is not materially changed. The summary shows that eighty out of the 137 starters finished the full course. Of the finishers seventy-one were of French manufacture.

A Panhard, driven by Jarrott, won the heavy-car class in the Circuit des Ardennes. A Gobron-Brillie, alcohol car, won the light-car class, driven by Rigolly.

Can't Turn Out Cars Fast Enough

It is more than a coincidence that the announcement of the development of the kerosene burner for steam vehicles to a practical point comes simultaneously with the report of a shortage of high-test gasoline in certain New England localities. Editorial.

The Peerless Manufacturing Company, of Cleveland, despite a full force and a shop full of fine machinery has been able to turn out only three cars a week. Manager Kittridge announces that a deal is pending to acquire a factory plant at Lorain, O., so that a force of 400 men may be employed for next season's manufacturing.

The first American models of the C. G. V. car were completed last week at the Rome Locomotive & Machine Works, Rome, N. Y. The car is fitted with an American-made aluminum body and has a four-cylinder motor rated at 15 horsepower.

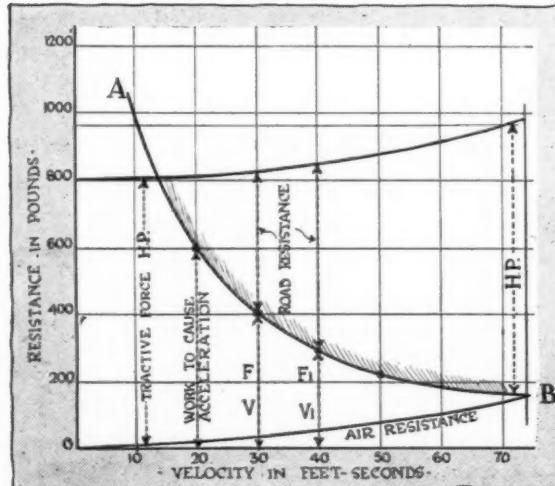


Fig. 1—The road resistance increases geometrically with velocity

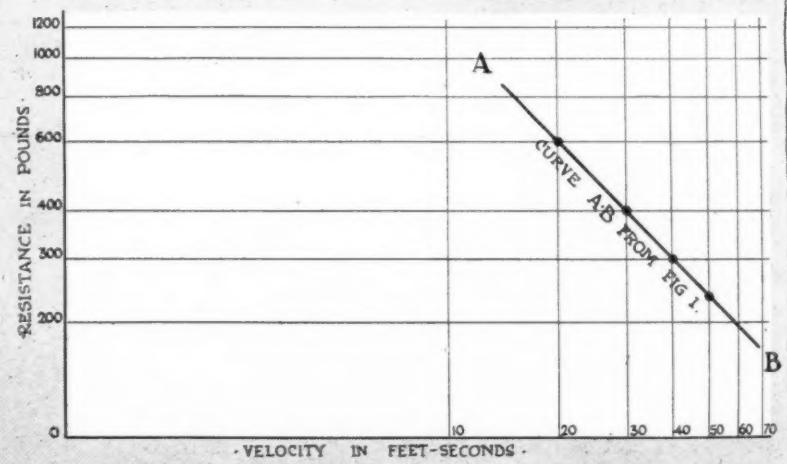


Fig. 2—Same condition shown by linear curve on logarithmic paper

Selecting Proper Gears

S. I. Fekete Shows a Simple Way of Determining Correct Ratio for Any Number of Speeds

In the July 18 issue of THE AUTOMOBILE there was published a very remarkable article, by W. H. Cameron, on the subject of the four-speed gearset. In this he predicts its general adoption and its necessity. This article certainly came at the right time and on the right subject.

In this article I wish to introduce a very simple mechanical way of determining correct gear ratios for any number of speeds. At the same time I wish to call attention to Mr. Cameron's reasoning and explanations, but would not advise following his diagrams, illustrating the steps between the gears, for the reason below stated.

In the diagram where ordinate O X is apparently the time, while the gears are engaged and ordinate O Y stands for the velocity, miles per hour. If we were to make a diagram like that which he illustrates before laying out a set of gears, and in this diagram the steps between velocities were to be equal, then the result would be in some cases an error, because such a diagram gives us the arithmetical progress instead of that which we need, the geometrical progression.

Gears Should Progress Geometrically

According to my way of thinking the gears in a gear-set should progress in a geometrical progression because the resistance increases in the velocity interval in a hyperbolic curve. During acceleration the road resistance increases and is a function of the velocity. If we suppose there is one even condition of the roadbed, going at top speed, the road resistance consumes the power output of the motor. If we analyze the increase of the resistance, we find that it is in geometrical progression.

When a car starts, a certain amount of work is required to cause acceleration and the other part of this work is required to overcome the resistance of the car. The total tractive effort given by the motor is consumed by these two factors. When the resistance is so high as to consume all the tractive effort, then there is no more work left to cause acceleration and so the car begins to travel with a constant velocity. In equation:

$$\text{Resistance} = \text{tractive force.}$$

During acceleration the work is consumed by two factors, one which causes acceleration and the other is the resistance, that is

$$\text{Force to cause acceleration} + \text{resistance} = \text{tractive effort.}$$

If we imagine a constant horsepower output during acceleration, then

$$\text{Horsepower} = \text{constant} = (\text{force to cause acceleration}) \frac{V}{550}$$

or

$$\text{Horsepower} = \text{constant} = \left(\text{mass} \times \frac{\text{olv}}{\text{olt}} \right) \frac{V}{550}$$

And this is equation of a parabola.

Let F mean the force to cause acceleration in one interval (in Fig. 1) and V the velocity.

Farther F_1 — the force to cause acceleration in one other interval when the velocity is V_1 .

Then

$$F \times V = \text{constant}$$

$$F_1 \times V_1 = \text{constant.}$$

This equation of a hyperbola referred to its asymptotes will represent the increase of resistance.

To prove that this curve in Fig. 1 is geometrical progression, it is necessary to plot it over on logarithmic paper. On this paper it should appear as a linear function.

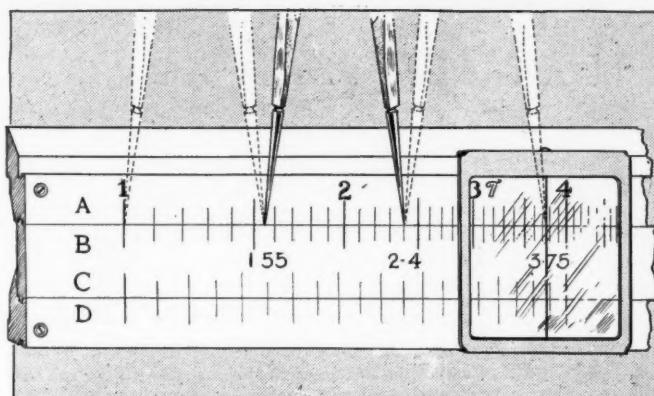


Fig. 3—Geometrical progression illustrated with a slide rule

In Fig. 2 ordinates O X are the values of the velocity and the scale used is a logarithmic scale of the slide rule.

Ordinate O Y signifies the resistance in pounds on the same scale. On this diagram, if we take equal steps between gears taken, between any chosen points, then they will give us a geometrical progression.

If we take a divider and make steps on the scale, such reading will give us geometrical progression. To get any number of gear ratios between a chosen lowest ratio and to the direct drive, all that is necessary is to divide the slide rule into as many equal spaces as we want intermediate speeds. If we begin dividing at the point which is our lowest gear and take the readings where the dividing points come we will get the correct theoretical gear ratios. This division may be subject to change during process of designing, on account of inability to secure even center distances and pitch. See Fig. 3.

Lessons from London Rubber Show

Speaking to the colonial branch of the German Agronomic Society at a recent meeting, Professor Dr. Warburg, an expert on rubber questions, reported the impressions which he had received at the London rubber show held last year. It demonstrated the predominance of England and of Para rubber derived from the hevea rubber tree, he said. The English idea of cultivation and preparation was also ruling. Next to Great Britain, the country which made itself felt was Holland which showed rubber derived from ficus trees (same family as the fig tree) and guttapercha prepared from their leaves. The showing made by Germany, though assisted by the government, was inferior comparatively. Preparation methods were well exhibited, however, and the apparatus for rubber testing were brilliantly instructive. On the whole, the lessons of the show may be summarized as follows: (1) Para plantation rubber will rule the world markets in a few years under control from London; (2) where climate or high wages operate to disadvantage the exploitation of wild stands of rubber trees will stagnate or retrograde; (3) no immediate danger (?) of synthetic rubber crowding out the natural; (4) prices will in course of time drop considerably, as cost of production may be much reduced, but the danger (?) of overproduction of first-class rubber is still remote.

With regard to the probable fate of German rubber plantations the lecturer held that those in Kamerun and Togo as well as in New Guinea and the Samoan islands were not threatened. But in German East Africa the situation is different. Here 23,000,000 rubber trees, out of a total of 31,000,000 German-grown trees in all regions, are located and represent an investment of 20,000,000 marks. These plantations are cultivated by people who know little of agriculture, and many blunders have been committed. The raw material obtained from them is not of the first-class and cannot meet the competition in the world markets. The trees are largely manchot and ficus.—From *Allgemeine Automobil-Zeitung*, June 28.

9-11-2M REJS 34-11

MATERIAL USED					
Repair Job No. _____			Date _____		
DATE	REQ.	C. S.	QUAN.	DESCRIPTION	SELLING PRICE
			Total		

Fig. 1—Sheet for recording all material used on a job

System in the Service Plant

Illustrated by the Methods Employed by the New York Distributors of the Garford

Fifteen Forms are Used and the System Requires the Entire Time of But One Man

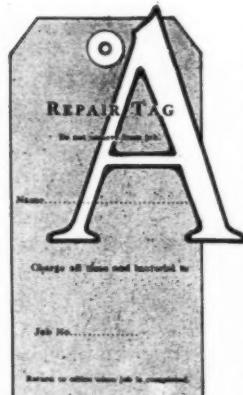


Fig. 2—Repair tag used by R. & L. Co.

GOOD business system is to a merchant what his multiplication tables are to the schoolboy. Both enable their operators to handle a large bulk of operations in a simple and efficient way; both present a means of checking at any given moment the results of preceding operations with an infallible reliability. It is as useless and as senseless for the present-day business man to attempt to conduct his affairs in a manner not in accord with modern methods, as it would be for a schoolboy to attempt the solution of arithmetical problems without the knowledge of the fundamental operations and the rule of three.

As the repair business is a necessary branch of the automobile trade, every

improvement in the methods of carrying on the requisite operations will be welcomed by the progressive automobile business man. To him system means reduction of burden to a minimum and augmentation of profit to a maximum; moreover, the clever business man knows enough to keep the system as his servant and not to become the slave of the system. In selecting a recording system which will meet the requirements he will choose one which necessitates a relatively small amount of labor but which permits of recording every essential step in the repair of an automobile.

Division of the Work

The series of operations constituting the repairing of a car may be classified under three heads; the entrusting of the service department with the car, the work done on the car in the service department, and, finally, the testing and returning of the automobile to its owner.

In the first and third operations the owner is personally concerned, or at least is represented by his chauffeur, and his attention is naturally focused on the state the car is in before

and after the repair and also on the condition of the automobile's equipment. The second operation, or rather set of operations, is of eminent importance to the owner of the service department. Therefore, the interest of the owner makes it necessary that the condition of the car be most closely examined before the machine enters the shop and after it leaves it, while it is of the utmost importance to the operator of the repair establishment to keep himself informed as to even the smallest expenditure of money, time and material in the repair of every automobile in his shop.

Recognizing this necessity, leading automobile companies have devised elaborate control systems serving the purpose outlined above. An up-to-date system, that of the R. & L. Company, New York City, distributors of Garford pleasure and commercial cars, is described below. The system covers practically every phase of modern service, so far as the repair of automobiles is concerned, and for this work thirteen separate cards and sheets are required. The purpose of these is as follows:

1. Two forms for outlining by the owner, the work to be done in the shop and to give an index of the equipment on the car, when it is turned over to the company.
2. A tag also giving a list of the repair jobs, and which is attached to the car.
3. Three forms, to record the labor required in the car repair.
4. Three forms to keep record of the material used.
5. One slip for enumerating outside or cash expenses made by men in connection with repair work.

Service Bldg.

R. & L. COMPANY
J. R. Rainier, President
Garford
MOTOR CARS AND TRUCKS
1880 BROADWAY

INVENTORY
OF
CAR OR TRUCK

Receipt for	Owner	Sign (R. & L. Co.)			
Model	Chassis No.	H. P.	Cylinders	Job No.	Shop No.
INVENTORY					
License	Mat	Vanity Case			
Belt in motor	Keel Rail	Steering Tube			
Shoes	Body Rail	Trunk Case			
Tools	Skin Carpet	Trunk Rack			
Top (Camo)	Windshield	Magneto			
Envelope	Dom Light	Batteries			
Shoe Irons	Cigar Lighter	Battery Box			
Shoe Strap	Other Lights	Tool Box			
Shoe Lock	Umbrella Holder	Oil Case			
Speedometer	Lioness Number	Overdrive			
Watch or Clock	License Plate	Cash Register			
Horns	Exhaust Wheel	Curtains			
Kitacs Complete	Electric Regulator	Crank Handle Case			
Rings	Condenser	Spoke Wheels			
	Panel Windows	Oil Gauge			
	Condition Windows	Windshield			
	Draw Windows				
Describe tools					
Particulars as to condition of					
Make thorough examination as to Dents, Scratches, Broken Glass, Worn Shoes, etc.					
Remarks:					
Have checked above Inventory, examined into condition of (Car or Truck) _____ and hereby testify that Inventory and general condition of _____ to be as described herein, and agree to have the necessary repairs required to put _____ in good condition.					
Remarks:					
Date	Chaffeur				
	Owner				
	Address				
	Supl.				
OWNER'S ACCEPTANCE					
REPAIRS COMPLETE					
The Repairs have been made to my entire satisfaction on _____ are in good order and the above Inventory delivered back to me all O. K. all articles herein described.					
Date	Chaffeur				
	Owner				
	Supl.				

Fig. 3—Accessories and equipment inventory blank

R. No. 1133							
REPAIR SHOP ORDER							
THE R. AND L. COMPANY							
GARFORD CARS							
DATE _____							
NAME _____							
ADDRESS _____							
FOREMAN WILL SEE THAT THE FOLLOWING WORK IS PROPERLY PERFORMED:							
COMPLETED							
O.K.	FOREMAN						
O.K.	SUPT.						
Material and Labor Cost Sheet							
MATERIAL							
Req'd No.	MATERIAL	COST	Req'd No.	MATERIAL	COST		
LABOR COST							
DATE	Workman No.	Rate	DATE	Workman No.	Rate	Amount	REMARKS

Fig. 4—Repair order. Fig. 5—Time and material record

6. One slip on which the working items which come under the guarantee are listed.
7. One form giving the results of tests made with the car by the company's inspector and by the chauffeur.
8. A daily service building report which is sent by the superintendent to the manager of the company; this sheet contains a detailed report of the work done in the establishment during the previous day and a statement of cars and materials received and delivered during the day. As this sheet also gives the number of new cars received from the factory and delivered to customers—the R. & L. Company also keeps its stock of cars at its service department—two more forms must be mentioned in this connection:
9. The delivery order giving the number of a car delivered to a purchaser, together with a statement of all the equipment furnished with it.
10. The receipt for delivery of such car to the purchaser.

In the following the various forms are described, each one being treated in detail and illustrated to show the advantageous arrangement of the various data on every blank here shown.

1. These forms are bound in books and are made out in duplicate, one copy of the document remaining permanently in the original binder. The other forms are kept in pads and are made out, in most cases, in duplicate, in one case even in triplicate, as will be detailed below. Where more than one copy of a form is made out, the duplicate is sent to the Broadway office

of the company either immediately or after the repair is completed. This is done for the double purpose of giving the office a check on the operations of the service department and to insure the preservation of one copy if the other is destroyed by fire occurring in either the service department or the office. The original of this form remains in the order book of the superintendent, a duplicate is mailed to the customer whose machine has been delivered to the department, while the triplicate accompanies the automobile which is brought into the shop. The form illustrated in Fig. 4 is numbered, each set of blanks in the book bearing consecutive numbers. The specific number of the order made out is written on every form used later on in connection with that job, so that it is very easy to refer from any particular sheet or card to the general information on the job kept at the office of the superintendent. This method of marking every form pertaining to the same job with the same number makes it also easy to file all the cards and sheets together, so that they are ready for reference at a moment's notice. All files containing the records of past transactions are kept at the Broadway office, with the exception of the forms remaining in their books.

Keeping Tabs on Equipment

When the owner calls at the service department with his car, he is met by the superintendent, who takes his order for the repairs to be made. Before the car is taken from the owner, however, a detailed list of the equipment and accessories on the car is made by the superintendent or his assistant, who, for this purpose, uses the blank shown in Fig. 3. This form is white, ruled with blue lines and printed in black, and a yellow carbon-duplicate sheet follows every white blank in the book. No standard type of accessory has been overlooked in preparing this form which even specializes on Klaxon horn, electric whistle, vanity cases, etc. Three lines are left open for the detailing of the tools kept on the car. The condition of the body and the equipment is also described on this blank. The owner or chauffeur, as the case may be, goes over the record and signs it, after which he retains the carbon copy of the form.

The details of the repair work which is to be done on the car appear on the triplicate form, Fig. 4, which is filled out with the name and address of the owner, as well as the date on which the car is brought into the building. The triplicate copy is also printed on the reverse side, as shown in Fig. 5, which is a blank for recording the costs of time and material used in the repair of the car.

2. At the same time with the order, Figs. 4 and 5, when the automobile is turned over to the shop, the repair tag, Fig. 2, is attached to it. This tag is of a dark vermilion, 3 by 6 inches, and is fastened to the steering wheel of the car, with the name of the owner and the job number being clearly written on the front side. The reverse side is not printed but left blank, and on it the different repair jobs to be done on the car are enumerated. This design and use of the repair tag makes the working system very simple for the laborers who handle the repairs; further-

TIME						
Repair Job No. _____	Date _____					

DATE	WORKMAN	NO.	HOURS	RATE'	CHARGE'	COST
Total						

Fig. 6—Sheet used for recording all labor spent on a job

Fig. 7—Slip used by men in accounting for outside expenses

more the order, Fig. 4, is kept clean, as it remains at the desk of the foreman. All the workingmen have to do is to check each successive item of the work on the tag when that work has been completed.

Little Record-Keeping for Men

3. The less the men who have to concentrate on manual labor are bothered by the keeping of records, the more readily will they supply what information the company demands, while their work is proceeding. The R. & L. Company has simplified the extent to which the workingmen have to participate in the recording system, and all the writing that is necessary for them to do is done in connection with the recording of their own time and labor; consequently the men are glad to adhere to the system in their own interest. To record the time spent by the men in the shop, as well as its distribution on the various jobs, two cards, each 4 by 5 1-2 inches, are used. Fig. 8 is the ordinary clock card, on which each man stamps time in and out, during the morning, afternoon and when working overtime. This card is a weekly one, and at the end of every week the daily total times of each man are calculated and summed up to give the number of hours he worked during the week. The results are marked at the bottom of the card and the total wages paid to the man for his week's labor is also written thereon, so that the workingman, when receiving his pay, may check it against his time and sign for the money, after which the card serves as a receipt. The spaces Number and Name printed on this card have reference to the workingman. This card is kept at the office until pay-day, after which it is filed in the Broadway office.

Fig. 11 shows the time spent on individual car repairs. When a man starts work on a new repair job—that is, one on which

				No. _____	
Name _____					
<p>Each man his own timekeeper. We pay by this record, your own recording.</p>					
Morning		Afternoon		Overtime	
IN	OUT	IN	OUT	IN	OUT
Week Ending _____					
Regular Time		Hrs.		Rate	\$
Overtime		Hrs.		Rate	\$
Total Wages \$ _____					

Fig. 8—Clock card of shop workers

a man's start for the work and of his return therefrom are marked on this card. This card is held by the foreman until the completion of the repair job; then it is turned over to the superintendent or his assistant.

The total time expended in the repair of a car is recorded and itemized on a time sheet, Fig. 6, which is made out from the job-time cards by the foreman of the repair shop. This sheet is 6 3-4 by 11 inches. It remains on the desk of the foreman and every morning the time records from the cards, Fig. 11, are transferred to this sheet, which is also marked with the job or order number. The foreman in filling out this blank notes the dates of the various steps of the repair, the name and number of the workingmen who did them, the number of hours spent by each man on each job, his rate of payment and the consequent cost of the labor on each step of the work. When the repair of the car is finished, the foreman totals the hours spent on the car and the cost of the labor, and, after checking once more and signing the items, sends the sheet to the superintendent of the service department, whence it passed with other blanks relating to the job, to the bookkeeping department of the Broadway office.

Fig. 9—Requisition used when material is drawn from stock

4. At the time, when the time sheet is first made out by the foreman, a carbon is made of the information written on the three top lines of the sheet, the carbon record appearing on the Used-Material sheet, Fig. 1. After the sheets have thus been started, they are taken off the original pad and the time sheet, which is yellow, is kept on one file, and the white material sheet on another. Both sheets are of the same size. On the material sheet every piece of material, every pound of waste and every pint of gasoline used in the repair of an automobile are recorded, with the dates of their use, their requisition numbers and their cost.

In order to keep the stock of the service department in strict order, a requisition must be used, whenever material is drawn from the stock room, whether it be worth 1-20 cent or \$15 or even more. It is a well-known fact that where the men are not used to keep track of every cotter pin or nut, they will in time permit an inexactitude to occur in the stock of more intricate and more valuable parts. The severe obligation of recording all material leaving the stockroom is founded not only on direct economic considerations, but also on moral ones which give rise to a situation of the *vastest* economic importance to the business. Therefore, no material must be drawn from stock without turning in a requisition. The latter is shown in Fig. 9. The method

of procedure in its use is as follows: If a man requires a part or other material, he so informs a floor boy and to him specifies his needs. The boy thereupon goes to the assistant of the service superintendent who fills out the requisition, which is made in duplicate. The latter is kept by the writer of the requisition and at the close of the day is sent to the Broadway office. On the requisition appear the number of the bin in which the part is kept in stock, the nature of the part required, and the price which is charged for it to the customer. After filling out the requisition, the assistant superintendent signs it and the boy takes it to the stockroom clerk, who delivers the material to him. All the requisitions are held on a file in the stockroom until the next morning, when they are deducted from the standing stock records; after this they are returned to the superintendent's office, who later on sends them to Broadway quarters. As the requisitions are numbered consecutively and when filled out are marked with the numbers of the jobs for which the necessary material is used, a mutual control between stockroom and superintendent's records is possible for the main office of the company.

It must be remembered that no material whatever is allowed

CUSTOMER'S CREDIT	
SERVICE BUILDING	
 <i>J.T. Rainier</i> PRESIDENT	
<small>DISTRIBUTORS</small>  MOTOR CARS AND TRUCKS	
1880 BROADWAY	
Goods received from _____	
Date, _____	
Customer _____	
Requis. No. _____	
By whom ordered _____	
Send this slip over to office.	

Fig. 10—Customer's credit slip balances unused requisitions

to leave the stockroom without being exchanged for a requisition. Consequently, when a workingman goes on an outside repair job, he will in many cases be required to take along material that might be used in his work, but which may prove later to have been unnecessary and must be returned to stock. When a man goes out and takes material with him, be it parts, waste or anything else, he has a requisition filled out. If he returns with unused parts, he shows them to the superintendent or his assistant, who then makes out a customer's credit slip, Fig. 10, which comes in a pad. Then he sends the parts back to the stockroom with a duplicate of the credit slip. There the returned parts or materials are checked against the requisition, and, if necessary, the stock file is rectified. When the duplicate is returned by the stockroom clerk, the superintendent sends it to the Broadway office with the other forms relating to the repair job.

5. In case of a man doing outside work petty expenses are invariably incurred, and these are taken care of in the following manner: The man, when going out, stops at the office of the department cashier, and there draws approximately the sum which he thinks will be necessary to cover his expenses. He signs a receipt for the money given to him and goes after his work. When he returns, his job being done, he fills out an expense slip,

COST CARD							
Date _____							
Owner of Car _____							
Job No. _____							
Workman _____							
Morning		Afternoon		Overtime		Time	
IN	OUT	IN	OUT	IN	OUT	IN	OUT
Remarks _____							
Regular Time		Hrs.		Rate		\$	
Overtime		Hrs.		Rate		\$	
Total Wages \$ _____							

Fig. 11—Worker's job-time card

is sent to the Broadway office with the other repair job records.

6. Labor and material which are charged to a customer are distinguished from those expenses which must be borne by the company, because the repairs made were necessitated by faulty material or poor workmanship in the car; in a word, when repair work is done under the guarantee. If a part must be drawn from stock to replace a broken part on a car, perhaps outside of the service department, an exchange ticket, Fig. 12, is filled out at the same time with the requisition for taking this material from stock. Exchange tickets come in the form of duplicate blank pads. The original ticket is pink, but the carbon copy is made on light green paper. This green copy is immediately sent to the Broadway office to notify it of the necessity of doing guarantee work while the pink original is retained by the superintendent. The same time the service department now proceeds to send a man after the broken part, who takes the material with him and if necessary installs it on the car. When he comes back with the damaged part, a white tag giving the model and number of the car from which it was taken is attached to the part, which is then sent back to the factory for the purpose of crediting the department with its value. As soon as the part has been sent away, the pink slip is also sent to Broadway, so that this office may await a credit note from the factory, until which time both exchange tickets are held on a special file. The factory is also charged with the labor.

Repaired Cars Given Road Test

7. When a car repair has been completed, the service department has the car tested out to see whether the damage has been completely remedied, and to insure the perfect operation of the machine, it being important to exclude the possible

EXCHANGE TICKET	
For Defective or Parts to be Replaced to us by the Garford Co. to the	
 <i>J.T. Rainier</i> PRESIDENT	
<small>DISTRIBUTORS</small>  MOTOR CARS AND TRUCKS	
1880 BROADWAY	
Date, _____	
(No Charge to Customer)	

Fig. 12—Exchange ticket used where guaranteed repairs are made

DELIVERY ORDER	
The R & L Company GARFORD MOTOR CARS NEW YORK	
Name _____	Order No. _____
Address _____ To be Ready on _____	
Chassis No. _____ Model. _____	
Body _____	Top _____
Body Color _____	Envelope _____
Gas Color _____	Curtain _____
Leather _____	Wind Shield _____
Tires _____	Speedometer _____
Horn _____	Tire Carrier _____
Head Lights _____	Side Lights _____
Foot Rest _____	Horn _____
Robe Rail _____	Rear Lamp _____
Tool Box _____	Presto Tank _____
Tools _____	Pump _____
Jack _____	Tire Kit _____
EXTRAS _____	

R & L COMPANY J. J. Palmer GARFORD MOTOR CARS AND TRUCKS 1911 BROADWAY	
INSPECTOR'S APPROVAL:	
New York, _____ 1911	
Have tested and inspected out _____ Chassis No. _____ and have found it to be perfect and ready to be delivered to the owner.	
Signed _____ Date and signature _____	
CHAUFFEUR'S OR OWNER'S ACCEPTANCE	
New York, _____ 1911	
Have thoroughly inspected and tested out _____ (owner) _____ accompanied with and in the presence of your inspector, Mr. _____ giving _____ service test on the road and it proves to be O. K.	
Chaffeur's name _____	
Job No. _____	
Chassis No. _____	
Box No. _____	
Other No. _____	

Fig. 13—Delivery order. Fig. 14—Tester's and chauffeur's blank

development of poor adjustments, etc., while making the repair. According to the differing nature of automobile repairs, the test made to insure that a good job has been done may be more or less extensive, as the specific conditions require; but the company prefers to give the automobile a good road test before returning it to the customer. One of the company's inspectors, an expert in the construction of the car, undertakes the test. He looks out for what necessary repairs may have been overlooked while the car was in the shop, and does what he can to tune the machine up generally to insure its good performance. When he has done this and found the automobile satisfactory, he reports at the office of the superintendent and proceeds to write out a test form, Fig. 14, which comes in a duplicate-blank pad. He fills out the upper half of the form, expressing his approval of the repairs made on the car. This having been done, the machine is ready to be redelivered to its owner, who is thereupon notified that he may call or send for his car. When the owner or

chauffeur calls, he finds the car ready for operation and is invited to test it out on the road to assure himself that the work ordered has been done well. When he has done this, he signs the lower half of the form, Fig. 14, to express his satisfaction with the repair at the time when his car was delivered. Then he is made to sign the equipment blank, Fig. 3, after having looked over his car to see whether all his accessories and other equipment are there. The duplicate test form is held by the superintendent, while the original is sent to the Broadway office.

8. The above-mentioned daily report which is sent to the Broadway office is the most original feature of the entire system, in that it is a complete statement of the day's work done in the service department, and also of the number of cars received and delivered during the day for the company's new, repair, and second-hand trade. The sheet which serves this manifold purpose comes in pads, is 14 inches wide and 17 inches high, ruled in blue and printed in black. Its two sides are illustrated in Figs. 15 and 17.

Complete Day's Work on One Sheet

This statement has a double value. It puts the main office in a position of having a record of the service department's operations for every day of the week and month, without the necessity of having any of its own officers spend hours over the records and forms which are sent over daily from the service department; moreover, it forces the superintendent or his assistant to go over the whole plant at least once a day and to take such insight into the affairs of the department that no mistake can get by the records. It is this type of live reporting, done by one or two capable men, which makes a system efficient and at the same time keeps it from becoming cumbersome. The daily report sheets are filed in the Broadway office, as they come in day by day, and are always ready for reference. There they form a standing source of record indicating what the work of the service department has been for any given time and how profitable or otherwise it has been.

9. Reference to the headings appearing on the daily report sheet show that the service department also receives and deliv-

SERVICE BUILDING REPORT					
New York, 191					
Cars and Trucks Received from The-Garford Company					
Date	Model	Chassis No.	Particulars		General Remarks
Cars and Trucks Sold and Delivered to Customers					
Date	Model	Chassis No.	Name of Customer	Where Delivered	General Remarks
Second Hand Cars Received into Stock					
Date	Model	Chassis No.	Stock No.	Particulars	General Remarks
Second Hand Cars Delivered					
Date	Model	Chassis No.	Stock No.	Particulars	General Remarks
Cars and Trucks Received for Repairs					
Date	Model	Chassis No.	Job No.	Owner	Work to be Done
Cars and Trucks in Repair Shop					
Date	Model	Chassis No.	Job No.	Owner	Will be Completed
(OVER)					

Fig. 15—Front side of daily report sheet which is sent to the manager of the company to keep him informed of department doings

REPORT CONTINUED											
Cars and Trucks Repaired and Delivered											
Date	Model	Chassis No.	Job No.	Owner	Where Delivered	Remarks					
Cars and Trucks Sent to Body-Builders											
Date	Model	Chassis No.	Body Builder	Address	Style of Body and Particulars	Date	Model	Chassis No.	Body Builder	Address	Particulars
Cars and Trucks Received from Body-Builders											
Date	Model	Chassis No.	Job No.	Demonstrator	Demonstration to Whom	Date	Model	Chassis No.	Body Builder	Address	Particulars
Demonstrations											
Date	Model	Chassis No.	Job No.	Demonstrator	Demonstration to Whom	Date	Model	Chassis No.	Body Builder	Address	Particulars
Report of Daily Sales											
Date	Cash Sales	Charge Sales	R. & L. Material Used from Stock								
Remarks											
Sign _____											
										OVER	

Fig. 17—Reverse side of the daily report going to the main office and filled out after personal inspection by assistant superintendent

ers new cars coming from the Garford factory and second-hand machines traded in by the Broadway store. This faculty of the service department calls for forms usable in connection with the work of handling these cars. When they arrive at the service department, the assistant of the superintendent makes a memorandum of the car's number and equipment, which he keeps on his desk, no special form being used for this end. After noting the number and model of the machine on the daily report sheet, the machines are turned over to stock. When any automobile is delivered to a buyer from the service building on the orders of Broadway quarters, the assistant of the superintendent fills out a delivery order or card, Fig. 13. These cards come loosely, like the time cards. The assistant superintendent gives the name of the purchaser, the sales order number which he receives from the Broadway office, and the date on which the machine is to be delivered. Then the details describing the car and its equipment, the number and model of the chassis, as well as a detailed account of the accessories carried on the machine, are entered on the delivery order, enumerating the most general accessories. The back side of the order is a short inspection blank containing the following items: fill oiler, fill radiator, gasoline, grease cups, tune motor, adjust brakes, which are checked by an inspector before the car is delivered.

Records Filed at Main Office

10. In this operation the receipt, Fig. 16, is used. The name of the purchaser, date of delivery and details regarding the car and its accessories are written on this form, which is made out with a carbon copy on yellow paper by the assistant to the service superintendent. When the owner or his chauffeur calls at the department, he signs the original and carbon copy of the receipt and retains the latter, while the former is sent to the Broadway office together with the delivery order. Both forms are filed there under their sales order number.

It has been stated above that when a repair has been completed, all the forms used in connection with it are sent to the Broadway office, to be filed there under the job number which first appears in Fig. 4. The forms which are sent together to

the main office are herewith summed up: Figs. 1, 4, 5, 6, 7, 9, 10, 11 and 14. The repair tags, Fig. 2, are all kept by the superintendent and are filed by their job numbers. The inventory, Fig. 3, stays in the book it came in. The clock cards of the workingmen, Fig. 8, after having been gone over by the foreman, are sent to the bookkeeper's and cashier's office for settlement at the end of the week. Exchange tickets, Fig. 12, are kept on a special factory credit file at the Broadway office. Figs. 13 and 16 go to the sales file of the main office. The daily report, Figs. 15 and 17, is kept on a special file in the main office for future reference.

This system requires the full attention of the assistant of the superintendent, as well as that of the stockroom clerk and the foreman, the latter two, however, doing other work in addition thereto, so that only one special man is necessary. The R. & L. Company stores and serves about threescore cars. The consequent cost of service per car is very low and the saving proportionately great.

RECEIPT			
To Be Delivered to _____			
Date _____			
Chassis No. _____	Model. _____	H. P. _____	Cylinders. _____
Inventory _____			
Received by _____			

Fig. 16—Receipt for new or second-hand cars sold and delivered



Suggests Machine for Testing Brakes—Right and Wrong Methods of Attaching License Plates—Light on Dyer Patent Situation—Removing Carbon from Manifold—Lubricating the Clutch—Running on Advanced Spark

Recommends Brake Testing Machine

EDITOR THE AUTOMOBILE:—I read with interest the article on brake efficiency and materials in your last issue, and in connection therewith would like to give some details of the methods employed in the Hudson factory in brake construction. We use fabric brake linings in which asbestos is interwoven with copper wires. The coefficient of friction is between 0.25 and 0.40. Our brake diameter, 16 inches, with 4 inches width of face. The car is able to stop in a distance of 35 feet when running at a velocity of 20 miles per hour. A very desirable feature of the present brake linings which are now on the market would be a greater conductivity of heat.

In my opinion, axle manufacturers are in a position to carry out experiments on their brakes, regarding their resistance moment, and it would be desirable if they would specify the results on their drawings. To calculate the retarding moment gives very uncertain results. Such calculations involve too many variable quantities and factors, such as the friction coefficient, and the action of cams and differential levers.

Obtaining the result by calculation, this way, it will never give the designer a near enough correct value of the brake moment, and to know this exact value it would be necessary to know the braking moment at the time when they select a certain set of brakes for their car. Of course, it would be still better if on their drawings they would furnish a character curve of the brake. This curve should indicate the increase of the moment, with the increase of the load applied on the end of the tightening system. The point of such a curve could be easily determined by a simple testing machine. The design of such a machine should be something like the following: A flywheel resting on two ball bearings and on one end of the shaft is connected with the hub of the rear axle. The other end carries a clutch which enables us to disconnect the motive power; also it has a sensitive tachometer. During the experiment it would be well if the gears on the differential and also the bevel gear were removed. To obtain the different readings, different weights should be ap-

plied on the end of the tightening lever. Then the calculation of the moment would be the following:

G = the weight of the flywheel concentrated in the center of gravity of the section of the flywheel.

r = radius of this point.

t = uniform length of time interval in which the revolution is recorded and in this interval the disk makes a revolution of n and in the following interval it makes a revolution of n_1 .

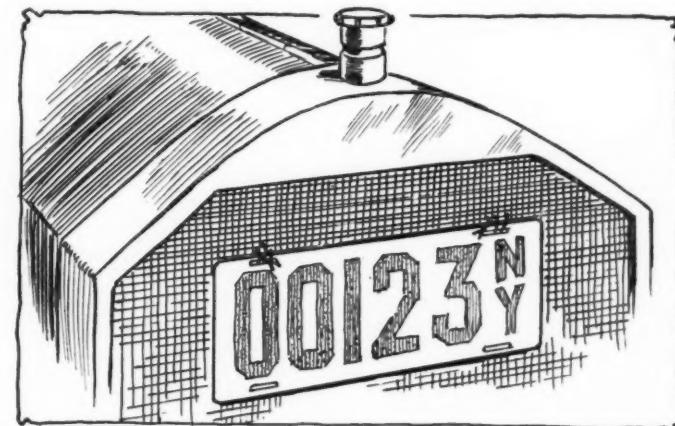


Fig. 2—This way of suspending license plate means radiator breaks

The mean angular velocity during the first interval is

$$\frac{2\pi n}{t}$$

and during the second interval is

$$\frac{2\pi n_1}{t}$$

then the retarding moment in the t = time interval on a body which has a moment of inertia $G \times r^2$ — is equal to

$$M = \frac{2\pi (n - n_1) G \cdot r^2}{G \cdot t^2}$$

This moment is due to the friction coefficient, f .

If r_1 = brake radius, then

$$f = \frac{2\pi (n - n_1) r^2}{g \cdot t^2 \cdot r_1}$$

where $g = 32.2$.

This way, knowing the character of the brake moment, we could easily establish the rate of retardation due to the road resistance, because the variation of road resistance could be measured by the accelerating condition. This is given by the motor output because at top speed the motor output equals resistance. The total retardation of a car

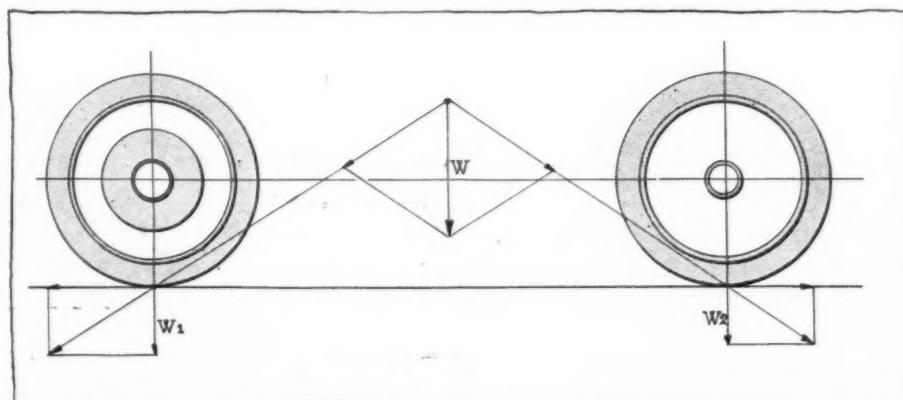


Fig. 1—Illustrating distribution in adhesion in front-wheel braking—car standing still

is the sum of the retardation due to road resistance plus retardation due to the brake. These two acting on a distance treatment is the work done by retardation. When the brakes are thrown into engagement, the capacity of doing work against retardation is

$$\frac{MV^2}{2}$$

foot-pound per second. Consequently the distance traversed during the action of resistance is

$$\text{Distance} = \frac{MV^2}{\text{Mean resistance}}$$

To know the character of resistance would also be important in a case of transmission brakes. Here the disk running on a higher speed gives a larger friction surface than in the rear brake. The resistance of a correctly designed transmission brake should not be greater than the torque of the motor on low gear. I found that many transmission brakes give an overload on the rear axle pinion bearing as high as 300 per cent., which is decidedly harmful even if it acts only for a short length of time. The same requirements hold good on brakes on the jackshaft.

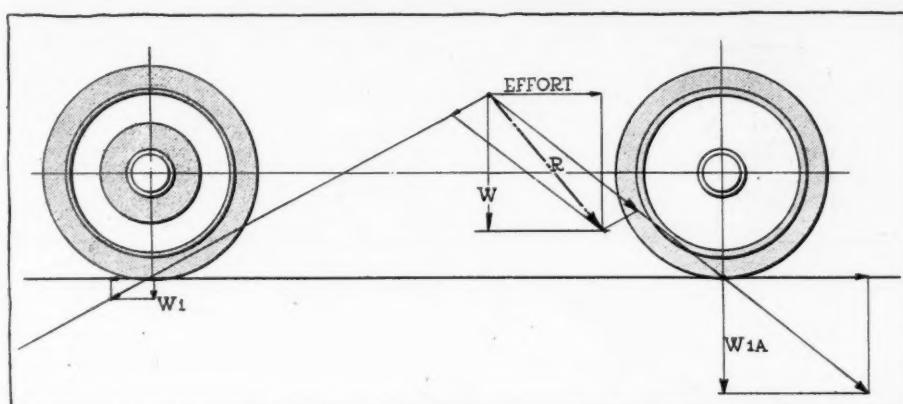


Fig. 4—Diagram illustrating increase of adhesion of front wheels with car in motion

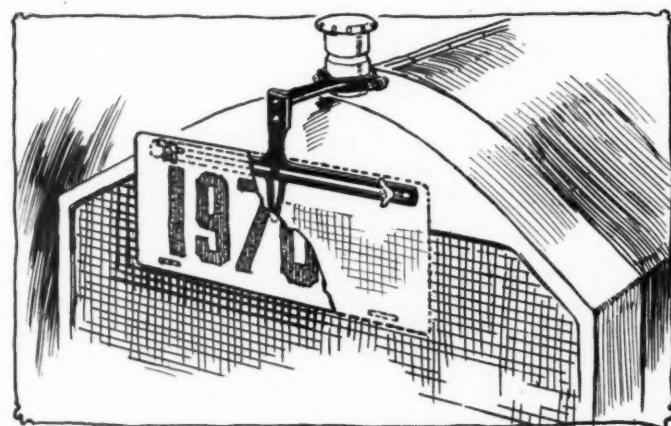


Fig. 3—Safe method of hanging license—radiating surface not lessened

In regard to the future of front wheel brakes: These have one disadvantage; this is the comparatively complicated brake shoe operation. Its advantage lies in the fact of the change of the adhesion on the wheels. Individual sets of brakes should have a retardation near to the locked wheel condition. The car, at rest, by the distribution of the weight has a larger adhesion generally on the rear according to the location of the center of gravity, Fig. 1.

While the car is moving, Fig. 4, the adhesion on the rear axle changes, due to the fact that the driving effort and the weight of the car is acting on the center of gravity. These two forces give a result of R, shown in Fig. 2. This R decomposed in the contact points of the wheel will give an increase of adhesion on the front. Consequently, the front wheel in the early part of retardation is able to carry a larger brake moment, as in the rear and at a lower speed, the adhesion again increases on the back axle. Therefore, the front brakes give a quicker rate of retardation as a correctly designed transmission brake, with a rear axle brake, would give.

Detroit, Mich.

S. J. FEKETE.

Care in Hanging License Plate

Editor THE AUTOMOBILE:—What is the best way to hang a license plate? I wired mine to the radiator and have practically ruined the latter.

New York City.

SUBSCRIBER.

—Many licenses are carried by car owners in the manner shown in Fig. 2. The wires are run through the openings in the radiator and passed through the holes in the license plate. When the car passes over road obstructions it shakes the license plate causing the wires to break down the structure of the radiator.

The plate should be hung in some such manner as by the bracket shown in Fig. 3. In this way the radiating surface is not cut down and a much neater appearance is made. When the license plate is put on such a holder, however, the owner should remember the following important point: Always have a leather or rubber washer between the thumb screw and the enamel or the latter will start to chip and before long a large amount of the surface will snap off. The same point should be remembered in attaching plates to the rear brackets.

Concerning the Dyer Patents

Editor THE AUTOMOBILE:—As an owner of an automobile I received a notice from Dyer, Dyer & Taylor, attorneys, calling attention to infringements of the Dyer change-gear patents. In your issue of THE AUTOMOBILE, page 1315, June 13, you make mention of individual licenses being issued. As an automobile owner I am interested in the proposition, as I feel sure are other owners as well, and I for one would like to know where I stand and what is to be done. Possibly in some previous issue of THE AUTOMOBILE you covered this subject, and if so I failed to see it. If not, why not let your readers know just where are their rights in the matter and what to do should they receive these lawyers' notices of alleged infringement?

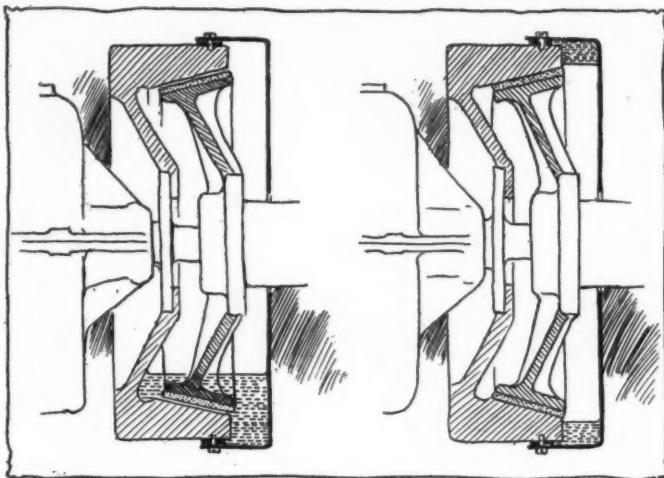
New York City.

AN AUTOMOBILE OWNER.

—The Dyer patents, referred to in your letter, were duly granted by the Patent Office and at this time are in process of adjudication in the United States District Court. There are but two courses open to an automobile owner in your predicament. First, to disregard the notice and second, to take out a license. If you follow the second plan, the matter is settled at once. If you disregard the notice and the complaining party pursues the usual course, suit will be filed in the United States District Court asking for an injunction, accounting and damages.

Any attempt on the part of THE AUTOMOBILE to forecast the action of the United States District Court touching any matter pending before that court would be the height of impropriety. The patents in question have not been adjudicated, but all patents carry with them a presumption of validity until the contrary is shown. Therefore, it would be in bad taste for THE AUTOMOBILE to prejudge or anticipate the action of the court in any patent case.

The present status of the suits brought under the patent is inconclusive. Four main suits against the Locomobile, Maxwell, Winton and Saurer respectively are now before the court as well as several scores of individual suits. The four suits referred to above are being defended by William A. Redding, but no answer to the original complaint has yet been made. When this answer is filed, proof of the patent will be taken in due form and the



Figs. 5 and 6—Showing novel method of lubricating clutch

facts upon which the defense relies will be put in. The testimony will then be submitted to the court and arguments will be heard on both sides. The opinion of the court will be rendered and in such an important matter it is reasonably certain that no matter which side prevails, appeal will be taken to the United States Circuit Court of Appeals. Ordinarily this court is the tribunal of final resort in patent matters and its decree will be accepted as the law of the land on the particular measure involved.

It is conceivable, however, that the Supreme Court may accept jurisdiction of the cause after decree by the United States Circuit Court of Appeals.

Before decree, the patentee, or his assigns, may proceed against alleged infringers irrespective of pending suits.

In the Selden litigation, it will be remembered, suits against individuals were filed; licenses were granted and proceedings in court prosecuted during the pendency of the basic or main suit against Henry Ford, *et al.*

When the Selden suit was overthrown in the United States Circuit Court of Appeals and the limits of the patent sharply outlined, the decision of the court served to check further proceedings against defendants whose cases involved the same facts covered by the decree.

In case suit is filed against you, if your attorney puts in an answer and takes advantage of all the chances for delaying a hearing that the case is susceptible of, it may be that in the meantime the main suits will be tried and in case the defense prevails, there is a chance that your suit will be dismissed without coming to trial. This should be considered in no wise advice from *THE AUTOMOBILE*, as the whole question is one for the automobile owner to answer for himself.

Kerosene and Water to Remove Carbon

Editor THE AUTOMOBILE:—Do you believe it a good idea to introduce by way of petcock in the manifold between the cylinder and carburetor kerosene while the engine is running? In some publication I noticed an article that kerosene and water in alternate doses would remove carbon. Do you think this a good practice?

Amsterdam, N. Y.

H. L. REED.

—According to the idea expressed in this communication the petcock would be located in some such position on the manifold as is shown in Fig. 7. It would be very difficult to find many manifolds that would be suitable for such an application of the petcock on account of the vertical riser which would be prohibitive of placing the cock directly on the manifold, although it could easily be accomplished by the aid of an elbow. While the scheme would doubtless work very well, as it would allow the operator to put the kerosene into the cylinders while the motor is running, which is a very desirable feature, yet, if the kerosene is placed in the regular compression cocks on the top of

the cylinder as soon as the motor is stopped it will be sufficiently warm to vaporize the kerosene and in this form allow it to reach its maximum efficiency as a solvent.

The introduction of water into the manifold at this point is a matter which should be approached with great caution and it is difficult to see where the benefit of its use would be felt. The petcock would compel the use of another joint in material which has not been especially bossed to take the thread of the plug and which is not of sufficient thickness to be proof against a leak where the difference in pressure on the interior and the exterior of the manifold is very high. On the whole, it would seem more satisfactory to introduce the kerosene in the manner which has been previously described. That is, on stopping the car to put a compression cupful of kerosene into each cylinder and let the car stand overnight. When starting, open the petcocks for a while and blow out the accumulated matter.

A Unique Clutch Lubricator

Editor THE AUTOMOBILE:—I have a suggestion to make for slipping clutches, without the use of cushion springs, and would like your advice on same.

It is a plate screwed on the rear face of the flywheel enclosing the clutch. It can be put on a gasket and has a hole in the center, large enough to take the clutch hub. This plate will form an oil-tight reservoir in which clutch oil can be put to a certain level. I claim that this oil will lubricate a small portion of the leather facing of clutch for starting. Then when the motor starts, centrifugal force will cause the oil to spread into the form of a ring and entirely leave the clutch face, so that it can become dry again for transmitting power without slipping. I am driving a car with this type clutch and have had no trouble with slipping when using castor oil. I think this scheme will take away the only fault of the cone clutch. It will also keep out the dirt. (Figs. 5 and 6.)

Cranford, N. J.

HAROLD L. COLLINS.

Wants to Build and Equip a Garage

Editor THE AUTOMOBILE:—Could you give me an estimate as to what it would cost to put up and equip a garage suitable for general repair work such as you would have to do around a summer and winter resort? I do not want a large storage room. I would like to put in a small lathe, drill press and emery wheel run by a gasoline engine. I would like to keep a small stock of supplies such as would sell readily and would pay. If you could give me an idea of what it will cost and as to how it should be managed and also stocked, I would be greatly obliged to you.

Jackson Springs, N. C.

ROBERT B. COCHRAN.

—The following equipment will probably be sufficient for your needs: A small lathe, \$175; drill press, \$60; emery wheel and other small tools, \$25; a vulcanizer, from \$15 to \$50 varying with size; small gasoline and oil outfit, \$300; car-washing arrangement, \$10 to \$15; crane, \$80; gasoline engine, \$100. The prices for machinery refer to second-hand goods, procurable in any large city. Regarding the cost of erecting a suitable building it is

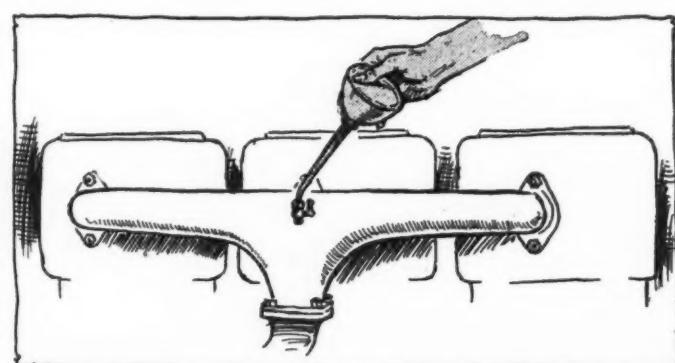


Fig. 7—Petcock on manifold for injecting kerosene to remove carbon

hard to say anything definite as it varies very much with its size, the material of which it is constructed and local conditions, so that it will be necessary for you to address a local contractor for a bid. Methods of conducting the business of a garage have repeatedly appeared in THE AUTOMOBILE, and the articles in the issues of April 18, 1912, and May 16, 1912, should prove of interest to you. If you have in mind to carry a small stock of supplies and accessories, this should principally include one or two good makes of tires in the most called-for standard sizes, tire repair outfits, oils and greases, spark-plugs and the like.

Pierce-Arrow Wiring Diagram

Editor THE AUTOMOBILE:—I have a 1912 Pierce-Arrow, 48-horsepower model, which is of the six-cylinder type. Can you give me the correct method of wiring the double ignition system and the proper order of firing the cylinders?

West Chester, Pa.

AMATEUR.

—In Fig. 8 the wiring diagram of the double ignition system is shown. The order in which the cylinders should fire is 1, 5, 3, 6, 2, 4; therefore the binding posts of the magneto spark-plugs in these cylinders should be connected to the distributor plugs marked 1, 2, 3, 4, 5, 6 respectively; that is, 1 on the distributor to cylinder 1, 2 on distributor to cylinder 5, etc. The spark-plugs for the magneto are in the cylinder heads. The second ignition system uses a storage battery and individual unit autocoils with a master vibrator. The connections are also seen in Fig. 8, together with the leads to the acetylene headlights, where dash-control of the illumination is used.

From Detroit to Delhi, Ont.

Editor THE AUTOMOBILE:—Will you kindly give me the route from Detroit, Mich., to Delhi, Ont.; also the road conditions and what is necessary in taking an automobile into Canada.

Chicago, Ill.

SUBSCRIBER.

—The best route to follow from Detroit to Delhi, Ont., is 611R of the Blue Book, which leads from Detroit to London, Ont., whence route 612 leads to St. Thomas, 40 miles from Delhi. The distance from Detroit to St. Thomas by the routes mentioned is 159.8 miles. In making this tour start from the Soldier Monument, Detroit, setting odometer at zero. Follow Woodward avenue trolley northwest and cross International ferry, 0.3, after which proceed to Windsor, Ont., to corner of Oulette avenue and Sandwich street. When meeting trolley turn to the left, then to the brick-laid road on the right, leaving the tracks into Glangarry avenue. From six-corners, 1.3, after meeting trolley car, turn to right into Howard avenue, crossing the railroad tracks at 2.4, 3.0, 3.1, 4.5 indications on odometer. At 9.3 cross railroad at Old Castle Station, then at Maidstone station, 12.8. Join trolley and cross tracks at 17.2, passing through Essex at 17.3; the trolley leaves to the right at 23.2. At 28.0 passing blacksmith shop, turn to the right, then at 28.6, at the end of the road to the left; then to the right with poles. At 30.4 enter Ruthven, turning to the left around the hotel and pass through Leamington, 34.1, and Wheatley, 41.9. Turn to the right at 46.1, and to the left with the poles at 46.5, proceeding on the curve to the left, 50.4, and to the right, 50.5. After taking the next curve to the left and then the right-hand road with the poles, observe caution in rounding curves along the lake, 58.6. Passing through Cedar Springs, 68.6, and crossing the railroad at 71.8, go through Blenheim, 72.6, thence to Ridgetown, 82.5. At 85.9 reach diagonal four corners and turn to the left across two railroad tracks, then into the next right-hand road, to arrive at Highgate, 88.9. At four corners, 91.2, turn to the left, then to right at 91.7. At the next four corners turn left, 92.3, reaching Clachan, 96.6, whence proceed to long iron bridge which is crossed at 103.8 and come to Wardsville, 104.1. Pass through Wood Green, Strathburn, Melbourne to Delaware, 128.9, turning to the right when reaching the church and at three corners, 134.2, turning to left, following sign "London." Pass through Lambeth, 141.2, across the iron bridge into London, 142.0. Start from there, corner Richmond and York

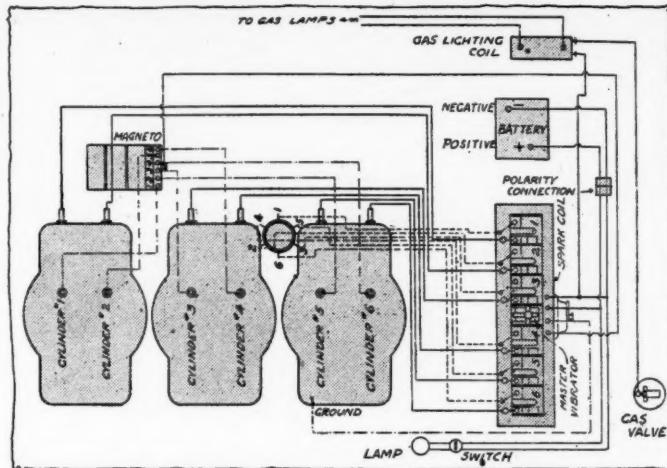


Fig. 8—Wiring diagram of Pierce-Arrow double-ignition system

streets, and follow the trolley across the bridge, at end of road turn to left on Wharncliffe road, pass under Grand Trunk railroad and run straight ahead, bearing to right at 145.4 and entering Lambeth. Then turn to left with trolley line, crossing the iron bridge at 149.5 and the railroad tracks at 157.5. Just before railroad viaduct turn to left at 159.1, turn to right into Talbot street, St. Thomas, 159.8. There inquire of natives for direct route to Delhi.

Using Light Oil in Gearbox

Editor THE AUTOMOBILE:—I have about 15 gallons of oil on hand which is not heavy enough for my machine. What ingredients should I add to convert it into a suitable transmission grease?

Hollywood, Cal.

T. J. BOSSERT.

—The oil can be mixed with any grease or non-fluid oil which will give the resulting compound sufficient body to have the requirements of a satisfactory gear lubricant. The result should be a soft paste.

The primary qualification of a gear lubricant is that it shall be of such composition that it will adhere to the surface of the teeth in spite of heavy pressure being placed upon it. When the power is transmitted from one gear to another the whole energy of the motor is distributed over the driving faces of the teeth and unless the viscosity of the oil is sufficiently high the lubricant will be squeezed out and rapid wear will result.

The oil which is drained from the crankcase of a motor may be used over in the gearbox when mixed with grease in the same manner as described for the light cylinder oil. It will have a waxy residue, which spoils it for cylinder use, but makes it desirable for the gearset in that it clings to the tooth surface.

Running on Advanced Spark

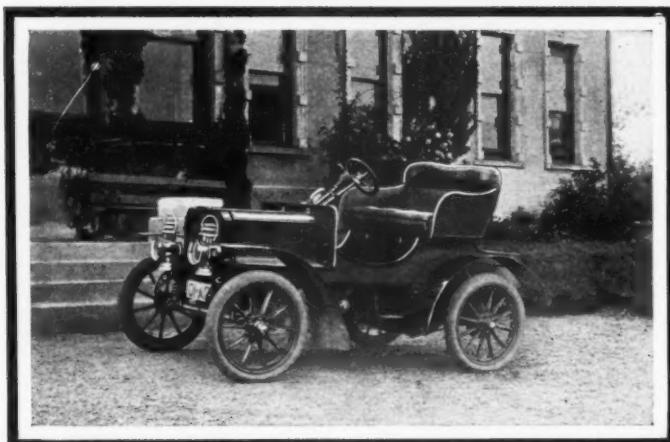
Editor THE AUTOMOBILE:—We have four chauffeurs, two of whom are unusually good mechanics, one with 15, the other with 9 years' experience. The car used occasionally by all four is often out of order. One claims it is best to run on advanced spark, another claims this method injures the machinery and claims that it is best to run on retarded spark.

Will you kindly give your opinion and oblige an old subscriber.
Fieldhome, N. Y.

CORTLANDT DE P. FIELD.

—The best economy and results are secured when the spark is advanced as far as possible without the slightest knock. This is the opinion of expert drivers, and it is backed up by results over measured courses with given quantities of gasoline. It is doubtless slightly easier on the machine to retard the spark a trifle further than this, following the idea that the ear is not sensitive enough to catch the knock as soon as it develops.

If the spark is advanced until the knock is heard and then retarded until the knock just disappears and then one notch further the results will be about right.



First car ever made in Ireland—a Chambers

Motor Trade in Ireland

Nearly 10,000 Cars in Use in the Emerald Isle—Good Field for American Automobiles

What to Avoid in Seeking Business—Only One Factory on the Island, but More Coming

DUBLIN, IRELAND, Aug. 5—Although there are upwards of 9,000 automobiles in use in Ireland to-day, the manufacture of this class of cars in the Emerald Isle at the present time is confined to a single factory, located in Belfast. An additional motor-car factory is, however, to be built in Dublin in the near future.

The automobile has long since become an indispensable fixed factor in Ireland, not alone for pleasure traveling, but as a commercial carrier. There are about thirty different makes of commercial cars in use in Ireland at present.

Ireland's business firms make use of great numbers of lorries and vans for the carrying on of commerce. This is highly practicable, for the reason that of the country's 54,000 miles of public roads, at least 50,000 miles are in splendid condition for traffic and the county councils are making them better daily by the application of the steam-roller. Hundreds of these machines are in active service.

The advent of the railways in Ireland resulted in much neglect in the upkeep of the public roads. Again, by reason of the old Grand Juries act, a bar was placed upon every description of power-propelled road-making machinery prior to 1898. But all of that is passed and Ireland is an ideal country for motorists and for the carrying on of motor traffic.

The fire brigades both of Dublin and Belfast have fallen in with the progressive idea. The type of motor fire-engine used in both cities, is identical. Very soon Cork and Londonderry will also be able to boast of a motor fire brigade.

Automobile drivers are well paid in Ireland. The speed laws are not tyrannical, and accidents are surprisingly few.

Quick Production No Advantage

There are but two American types of automobiles to be found in any number in Ireland. But the average Irishman who is in the market to buy a car wants to see it demonstrated; he wants to be able to purchase parts of the local dealer; and he will not be driven from the long-established custom of asking and receiving credit. Another thing, American agents traveling over here (one in particular gave moving picture demonstrations) do their level best to impress upon the Irishman that the Ameri-

can-made car is built rapidly. The Irishman shudders at the very thought. His first impression is that a car made hastily cannot be good. There is no use trying to break through conventionalities. It is better to say nothing about the time required for the production. Such talk only has a tendency to frighten the Irishman and spoil a sale.

Ireland today affords one of the best opportunities of any country in the world for the sale of automobiles. The country has awakened. It is prosperous. Its farmers are getting rich. They get as much per pound for butter and bacon as do the American farmers. The exports from this country last year amounted to more than \$325,000,000—\$72.50 per capita of population—making her the fifth exporting nation among eighteen. Ireland's people are buying luxuries, notably automobiles. But they cannot see that it adds anything to the quality of a car to prove that it was manufactured within a few hours' time. The history of the nation has convinced them that things to be desired are secured only after long and patient endeavor. They have not yet been educated up to the point where they can see the virtues of quantity production. In the accompanying illustration is shown the first automobile ever manufactured in Ireland. It is of the vintage of 1904, and was built at the Chambers works in Belfast. It is of the two-cylinder type and registers 7 horsepower. Everything about it, with the exception of the tires, was made in the Emerald Isle.

Other Foreign Opportunities

AUTOMOBILES FOR GERMANY—A big American company, which recently established an automobile agency in Germany, sold 10 cars during the first 3 months. Most of the machines are for pleasure purposes, but one is being used as a taxicab. An American Consul writes that there are persons in his district who are willing to form a \$50,000 company for importing American cars, but they desire the general agency for Germany or for all Europe if possible. They are looking for a four-seated car that could be sold for about \$1,000. American firms interested in this proposition may secure information by writing the consulate in question. File No. 9196.

SMALL MOTOR TRUCK—An American manufacturing company writes to the Bureau of Manufactures that one of its customers in a Latin-American country is interested in purchasing a small truck, with two seats in front and a space of about 5 1-2 feet behind, with cover, to carry a total weight of about half a ton. What is desired, therefore, is something in the nature of a runabout, but with the truck attachment described. Manufacturers interested in this should submit printed matter and prices f.o.b. vessel New York. File No. 9236.

LOW-PRICED AUTOMOBILES—A business man in a Mediterranean country informs an American consular officer that he desires to secure the exclusive agency or representation in that country of some American manufacturer of automobiles. An automobile of the touring type that will cost not more than \$800 f.o.b. New York is what is desired, and for this type a considerable market exists in the country in question. The inquirer desires illustrated catalogues, prices, discounts, and terms of payments. He can furnish satisfactory references and correspondence may be in English, Italian or French. File No. 9240.

AUTOMOBILES—A foreign business firm advises an American consul that it desires to purchase an American automobile costing from \$800 to \$1,500. Catalogues and prices, with shipping weights, are desired, and if possible the freight rate from port of shipment to city of destination, either via Hamburg or the Pacific coast. Correspondence and printed matter can be in English. File No. 9234.

If a motor 'bus breaks down in a London street and repairs are made in the street which cause inconvenience to the general traffic, it is within the power of a constable to take action against the driver for neglecting to have the 'bus towed to the nearest garage.

Big Paris Show Prospects

Nearly a Dozen American Cars Will Be Represented in Addition to Many Accessory Makers

Three Trade Associations Will Run the Exhibition on a Profit-Sharing System

PARIS, July 26—Nearly 30,000 square yards of exhibition space have been applied for in connection with the next Paris motor show to be held in the Grand Palais, Paris, from December 7 to 22. Every available inch of space has been booked and there is a big waiting list of firms hoping to get into the exhibition by the withdrawal of those already given stands. This year's show, the thirteenth of the series, is distinctive by reason of the large number of American firms taking part. The United States motor industry is represented by Cadillac, Buick, Case, Century, Flanders, Ford, Hupmobile, Mitchell-Lewis, Oakland, Reo and Overland. American accessory manufacturers are generally represented by French agents, who show the products on their own stands and under their own names. Among those having distinct stands are Rushmore lamps, Klaxon, Acheson Oildag, Werner Speedometers, Vacuum Oil Company. Only one American tire manufacturer will be represented at the show, this being the Goodrich concern, exhibiting through its European house. American machine tool manufacturers will be represented by Potter & Johnston. Among the few electric vehicles will be those of the Anderson Electric Car Company. This list of American concerns exhibiting at Paris is evidence of the important position the United States manufacturers are securing on the European market, for when the last show was held in Paris, 2 years ago, the only American-built car on exhibition was the Ford.

With every available inch of space booked up, the French manufacturers anticipate a bumper show. The increase has been brought about by the larger number of home firms wishing to compete, and by the increased applications from America and England. Up to the present English manufacturers have not considered it advisable to take part in the Paris Salon, especially as the French exhibition followed very closely after the one at Olympia. For the first time this year many of the leading British manufacturers have applied for space, among the more important being Argyll, Austin, Coventry Chain Company, Daimler, Hele-Shaw, Humber, Napier, Rolls-Royce, Star, Sunbeam, Vickers, Wolseley, and a number of accessory and tire makers.

The Paris show is now a purely manufacturers' concern, being organized by the three leading trade associations and run under a profit-sharing system. All exhibitors are entitled to share in the profits, although those belonging to the trade associations participate under more favorable conditions than outsiders. Stand positions are to be awarded by the drawing of lots, foreign exhibitors taking part under the same basis as the home firm, provided their own show organizers give equal facilities to French firms.

Congress of Material Testers

THE sixth congress of the International Association for Testing Materials will be held at the Engineering Societies Building the week of September 2-7. Delegates from every country in Europe except Turkey and a few of the less important states, several Asiatic nations and the United States have been named and it is expected that the congress will bring out a very representative, cosmopolitan gathering.

The Society of Automobile Engineers will be represented by Past-President Henry Souther. The technical program so far arranged includes 170 papers and at least thirty-five of Ameri-

Besides the regular sessions, the business of the congress will include trips to West Point and about the city and suburbs and at its conclusion the delegates may take a swing around the eastern portion of the country. A special train has been arranged for the party, leaving Sunday afternoon after the end of the deliberations and stopping at Washington long enough to allow of an inspection of the public buildings, Bureau of Standards and testing laboratories. The trip is scheduled to cover Pittsburgh for 2 days, including visits to the steel, cement, electric and explosive factories. From Pittsburgh the party will go to Buffalo and Niagara Falls, returning to New York on September 14.

The officers of the organizing committee of the congress are as follows: Henry M. Howe, president; Robert W. Lesley and Robert W. Hunt, vice-presidents; Edgar Marburg, treasurer; H. F. J. Porter, secretary, and W. O. Wiley, treasurer of the executive committee.

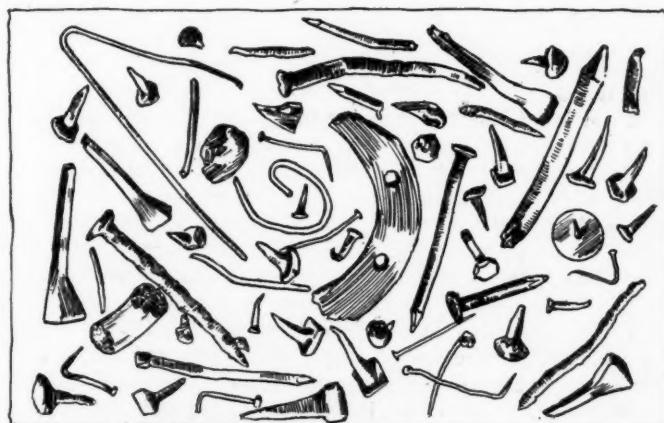
Two Boston Companies Go Under

BOSTON, MASS., Aug. 12—The Selbach Rubber Company, a Massachusetts corporation doing business at 404 Columbus avenue, has assigned. The assignment was made to Walter Powers, but no estimate has been made of the value of the business or the amount of the indebtedness.

Frank H. Coyne, doing business in Boston and New York under the name of the Detroit Tool Sales Company, and the Portable Machine Shop Company, an automobile accessory, made an assignment last week. He owes \$95,405, of which \$95,201 is unsecured among about 200 creditors. The creditors are scattered throughout the country.

Tire Shoe as a Junk Repository

About sixty bits of metal, as shown in the accompanying illustration, were picked up by the left rear tire of a Cadillac car in service on the London streets during the course of 1,000 miles. The owner of the car, a friend of A. Staines Manders, general manager of the International Rubber Exposition, which will be held at the Grand Central Palace from September 23 to October 3, was so impressed with the number of tire destroyers that he picked them out of the tire and had them photographed. Mr. Manders was so much interested in the demonstration of the danger to tires in London that he presented the picture to THE AUTOMOBILE. The curious part of the story is that the tire did not suffer a single puncture and the owner did not know that his tire was accumulating a load of metal until one day he was forced to extract the bit of horseshoe, shown in the middle. This did not cause a puncture and neither did the accession of the wire and wire nails. The thing that did the business was the small nail, shown at the lower right-hand corner and when it reached the vital spot, the shoe blew out for 22 inches. The tire tread and fabric had been so weakened by the repeated stabs that after the blow-out occurred the whole shoe was useless.



Collection of junk picked up by a tire in London

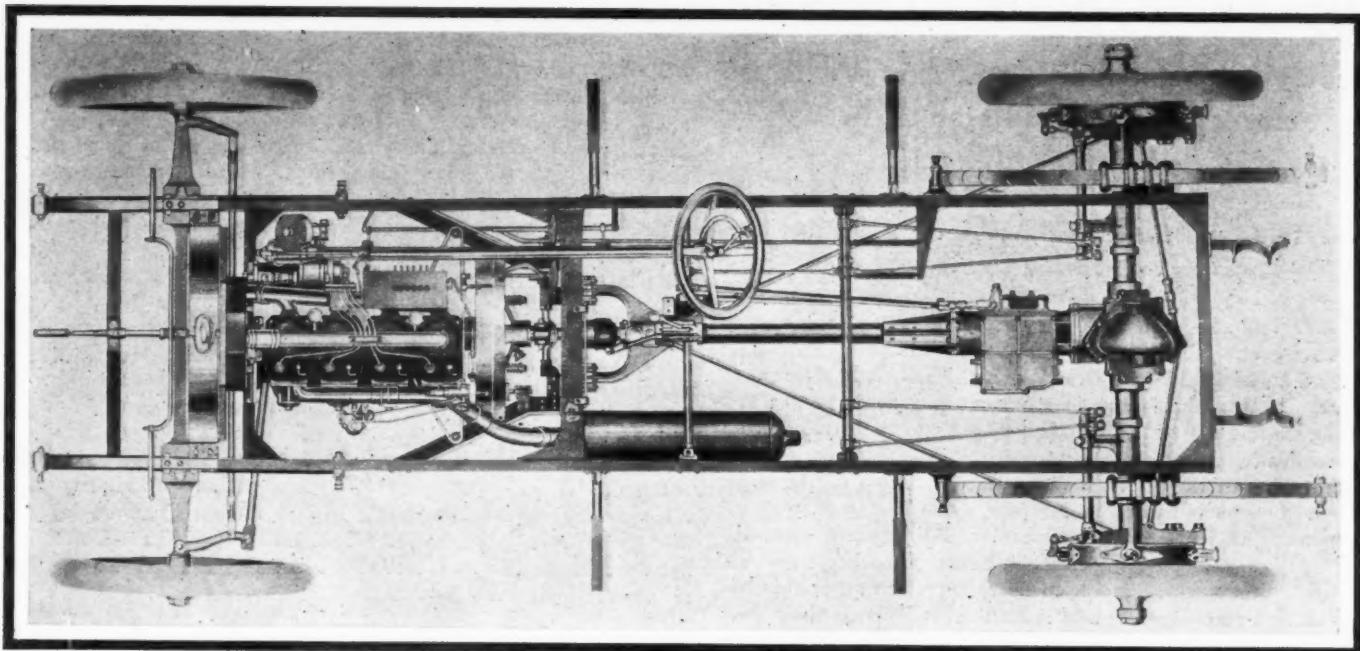


Fig. 1—Plan view of chassis of model 69 of the 1913 Overland line, showing location of gearbox

Two Models of 1913 Overland

While Characteristics of Line Are Retained, Quite a Number of Refinements Are Noted

Cylinders Are Cast Separately—Gearbox Is Located on Rear Axle—Eight Body Types Offered

THE Overland line for 1913 consists of two models, as for 1912. These are to be known as models 69 and 71, and replace models 59 and 61, respectively. A number of changes and improvements have been incorporated in the two, but on the whole they retain all the characteristics of the Overland construction. The gearboxes are located on the rear axles, motors have their cylinders cast separately, and while a number of changes have been made, these are principally refinements and do not alter the general Overland features.

Model 69, the less expensive of the two cars, is still the leader and its construction will be taken up first. The motor is a four-cylinder, L-head type; each cylinder is separately cast, as brought out in Fig. 1. The bore is 4 inches and stroke 4 1-2 inches, giving a horsepower rating of 30. The stroke-bore ratio is 1.12 and for this reason the motor will develop more than its rated power. As heretofore, cooling is by thermo-syphon system with a cellular radiator. The water capacity is about 4 1-4 gallons, and the total weight of the water in the cooling system 34 1-2 pounds. The maximum temperature reached by the cooling water is given as 198 degrees. The thermo-syphon cooling system obviates the water pump and is considered to be absolutely automatic. It is claimed that the speed with which the cooling water circulates is increased or decreased with every corresponding change in the power demand. In the Overland system, the water enters the lower ends of the cylinder jackets on the opposite side of the motor from that shown in Fig. 3. On becoming heated, due to the explosions within the cylinders, the water becomes partly steam and rises to the tops of the

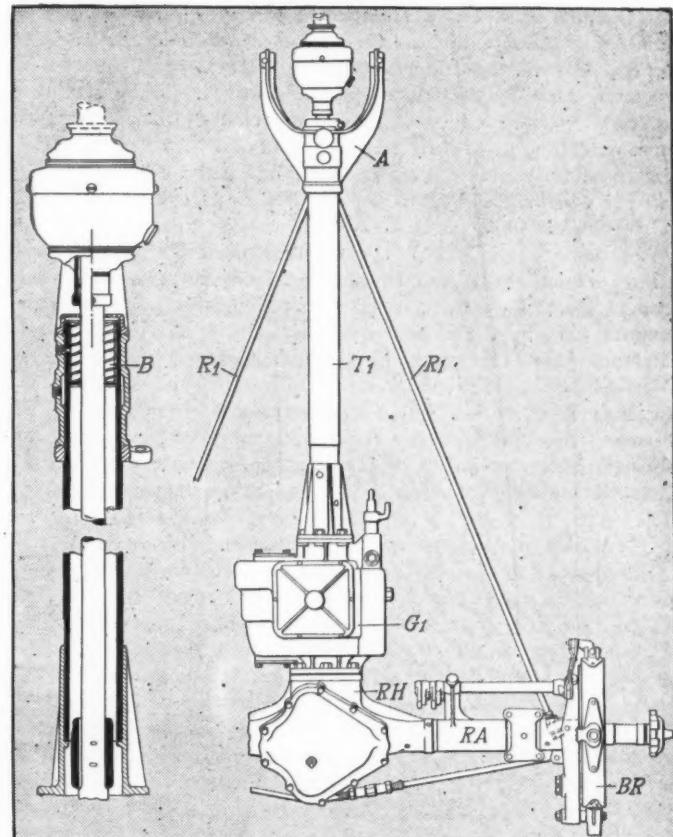


Fig. 2—Plan of Overland transmission and rear system

jackets entering the outlet manifold, and thence flowing into the radiator where it is brought into contact with the large cooling surface.

As to the mechanical construction of the motor, the pistons have a length of 4 1-16 inches and are fitted with three rings each. Improvement has been made in the pistons in that oil grooves under the lower rings have been added, each with six drain holes equally spaced around the circumference to keep excess oil from the piston heads.

The motor bearings are all of a babbitt which is an alloy of

tin, copper and antimony. The various bearing sizes are given below:

CRANKSHAFT—FIVE BEARINGS—Length rear bearing, $3\frac{1}{2}$ inches; diameter, $1\frac{1}{2}$ inches. Length of other four bearings, $1\frac{3}{4}$ inches; diameter, $1\frac{1}{2}$ inches.

CAMSHAFT—THREE BEARINGS—Front: 2 5-16 or 2 7-16 inches long; diameter, 15-16 inch. Center: 2 3-4 inches long; diameter, 15-16 in. Rear: 2 1-16 inches long; diameter, 15-16 inch.

MAGNETO SHAFT BEARINGS—Length, 2 1-8 inches.

CONNECTING ROD BEARINGS—Piston ends: length, 1 3-4 inches; diameter, 7-8 inch. Crankshaft ends: length, 1 3-4 inches; diameter, 1 1-2 inches.

WRIST PIN BEARINGS—Length, 3 3-4 inches; diameter, 7-8 inch.

The crankshaft and connecting-rods are of carbon steel, drop-forged. The wristpins are cold-rolled steel, hardened and surface-ground. The crankshaft steel has the following properties: Three per cent to 4 per cent carbon, 4 per cent to 6 per cent manganese, not over 4 per cent phosphor of sulphur, an elastic limit of 90,000 pounds per square inch, and an ultimate strength of 100,000 to 110,000 per square inch.

The properties of the camshaft steel are the same as those of the crankshaft, with the exception of the carbon content, which is from 1 1-2 per cent. to 2 1-2 per cent. carbon.

Details of Valve Mechanism

The valves, Fig. 3, have a clear opening of 1 9-16 inches and are of nickel steel, the dimensions being as follows: Diameter of head, 1 13-16 inches; length of stem, 5 3-8 inches; length of push-rod guides, 2 3-8 inches; length of push-rod, 3 1-8 inches; diameter of push-rod, 1-2 inch.

The valve tappets bear directly on the cams, which are integral with the camshaft. On the push-rod guides new oil-retaining washers have been placed.

The lubrication is a combined splash system for the crank and camshaft bearings and mechanical Kinwood force-feed

oiler for the cylinders and timing gears, as shown in the top view, Fig. 1. Ignition is by model RL Remy magneto and battery and model LE coil. This furnishes two sources of current. A change in the intake manifold has been made; it is now flanged instead of being threaded so that the carburetor may be removed without taking off the manifold. The Schebler carburetor has been retained on all models. The fuel is fed by gravity.

The clutch is of the cone type and leather-faced. This applies to both models. Power is transmitted from the clutch to the gearbox, which is placed at the rear, through a propeller shaft having a diameter of 1 1-8 inches. A view of the transmission system after it leaves the motor is shown in Fig. 2. The propeller shaft is enclosed in a torque tube T-1 which has a U-shaped arrangement A at its forward end where it fastens to the cross-member of the frame. As in the usual construction, two radius rods R-1 run from the forward end of the torque tube to the rear axle. The gearbox G-1 is bolted directly to the rear axle housing RH. A cross-sectional view of the transmission gears is given in Fig. 3. The gearset is of the three-speed selective type, the gear ratios being as follows: High, 1 to 1; intermediate, 1.55 to 1; low, 2.57 to 1; reverse, 3.30 to 1.

The rear axle, R.A, Fig. 4, is of the three-quarter floating type, whereas this model for 1912 was equipped with a semi-floating rear axle. The bearings are of the Hyatt roller type, as shown at B, Fig. 2. The length of the ends of the bearings is 1 9-16 inches, while the differential bearing has a length of 2 inches. The axle shafts are 1 1-4 inches in diameter, the left half LS having a length of 32 5-8 inches, and the right half 33 3-8 inches.

Brakes BR are increased in size over those of 1912, their diam-

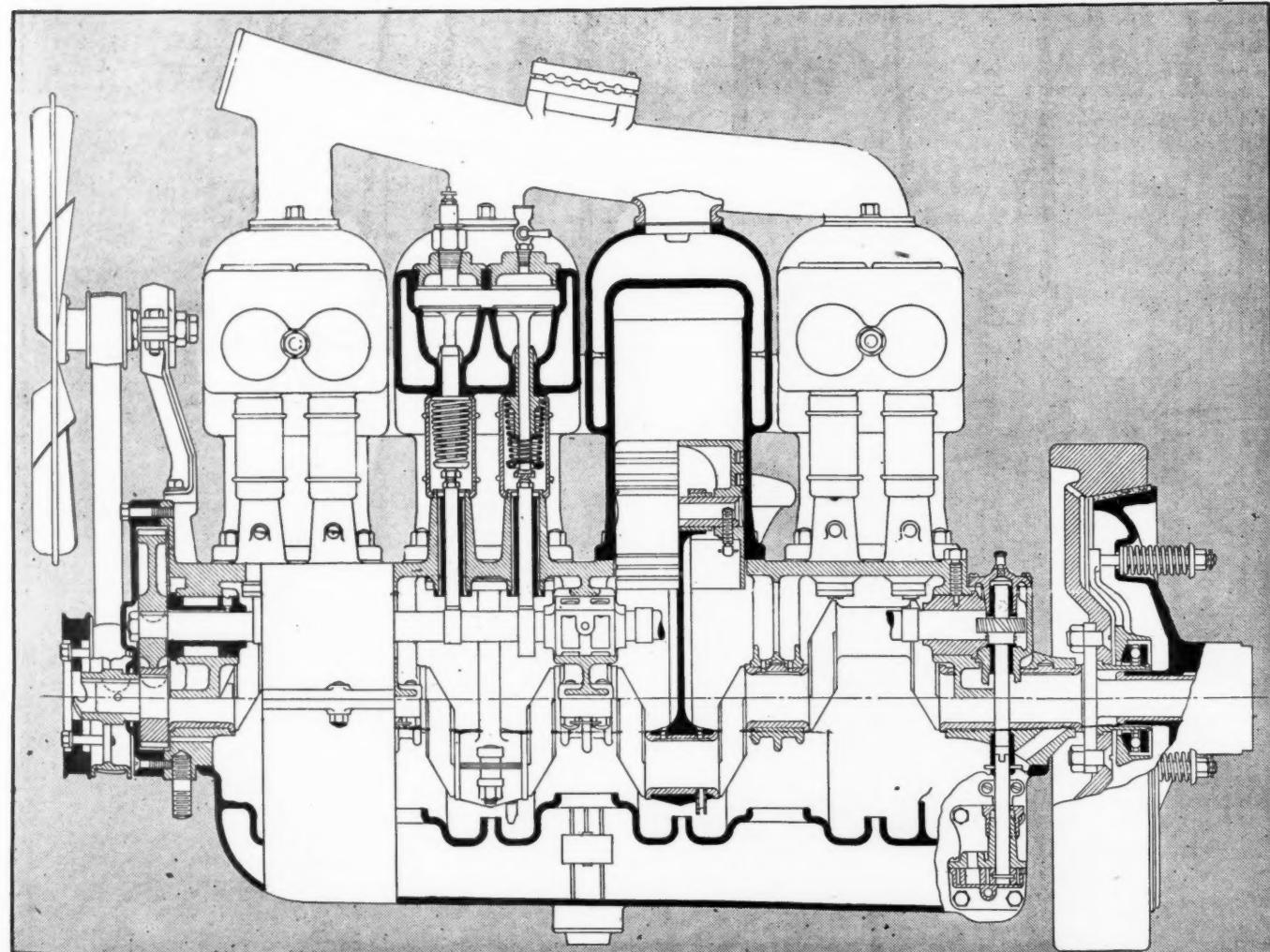


Fig. 3—Side part sectional view of the motor of Overland model 71, showing single-cylinder castings

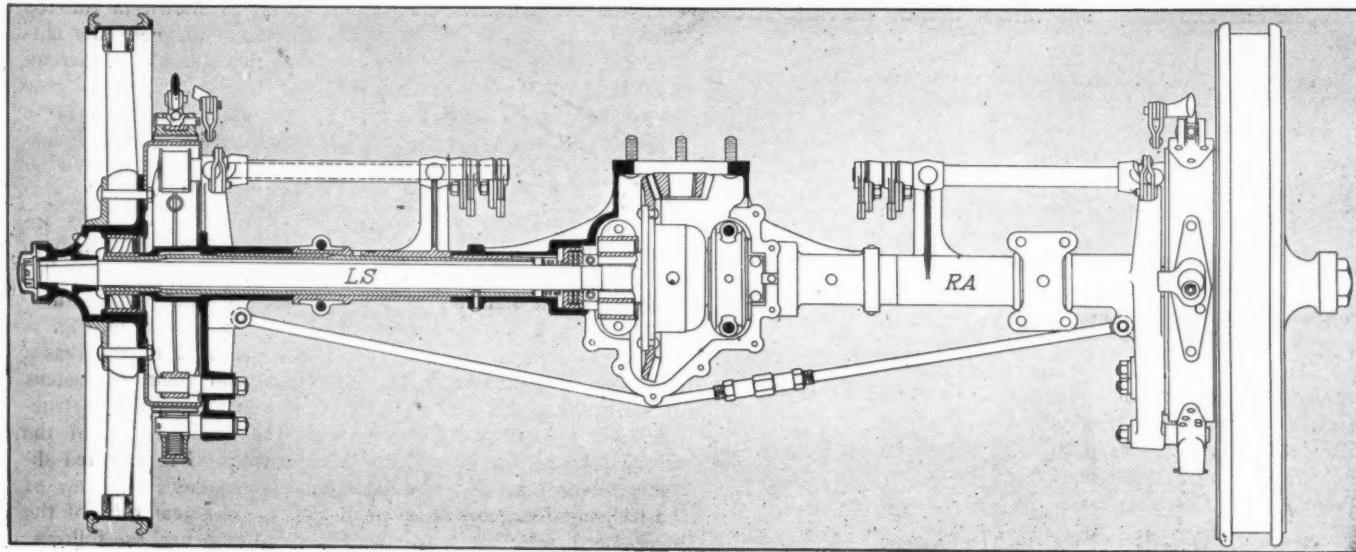


Fig. 4—Three-quarter type of floating rear axle used on 1913 Overland line

eter being 13 inches and width 2 1-4 inches. They are of the conventional external-contracting service and internal-expanding emergency types, their construction being shown clearly in the illustration herewith. The brake equalizing arrangement has been much simplified. Instead of the two operating shafts used on the 1912 models the new cars are equipped with a brake operating mechanism which consists of a tube and a shaft on which the equalizer parts are mounted. The arrangement of this new equalizing device is shown clearly in Fig. 8. Both service and emergency equalizers are at the right side of the frame and are fitted with special springs.

The frame is of cold-rolled steel channel section, No. 9 U. S. gauge. This has a thickness of .156 inch. The depth of the side members is 3 3-4 inches and the flange face width 1 1-4 inches. The frame is well braced with three cross-members, in

addition to the brake member which acts as an additional brace. The front cross piece is a little forward of the front axle, while the second one is just to the rear of the motor, the torque tubes, fastening to it. The third cross member is at the rear. The motor is hung in a form of sub-frame and has one supporting cross piece in front and one at either side in the rear. These rear supports run diagonally from the side frame members to the cross member at the rear of the motor and the crankcase arms bolt to them at about their centers.

The front axle is drop-forged of the usual bowed-center I-beam type, and affords a road clearance of 10 1-2 inches. Springs are all constructed with six leaves and are fitted with steel bushing eyes. The front springs are half elliptic, while the rear are elliptic. The spring sizes are as follows:

Front: Length, 36 inches; width, 1 3-4 inches.

Rear: Length, 42 inches; width, 1 3-4 inches.

The steering wheel is on the right with the control levers in the center. Spark and throttle levers are on top of the steering wheel on the usual type of quadrant.

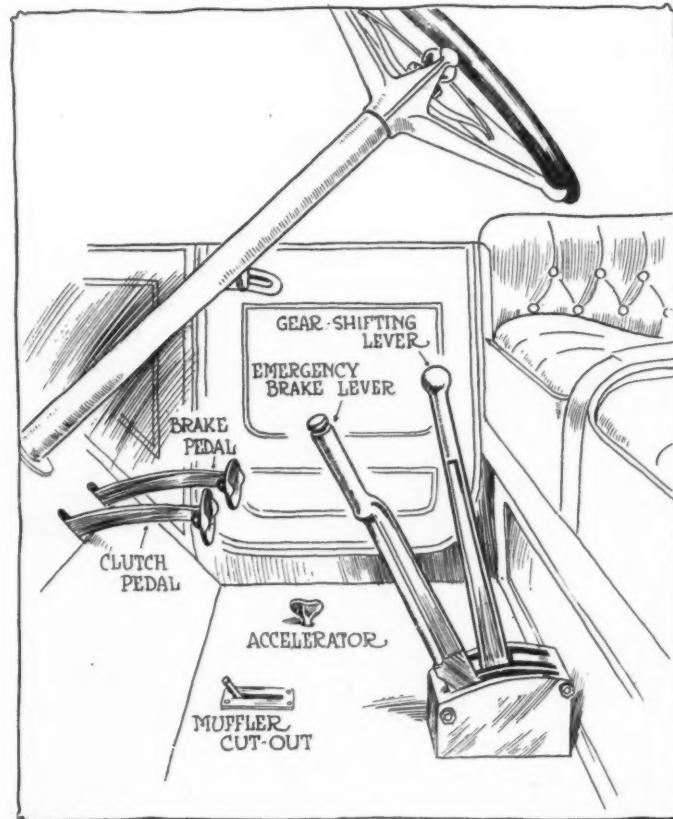


Fig. 5—Drive features of the 1913 Overland, showing center control

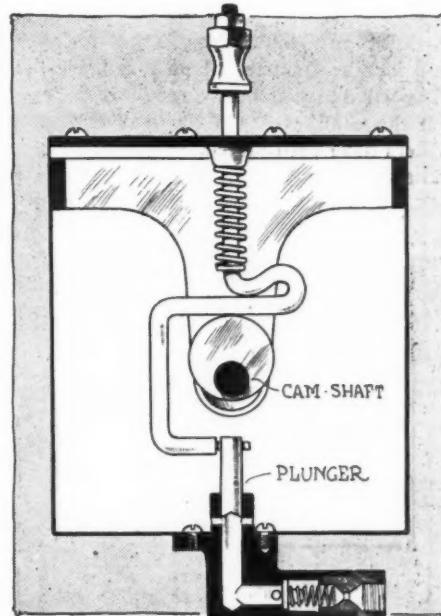


Fig. 6—Section of mechanical oiler used on model 69

Wheelbase Increased on Model 69

The wheelbase of model 69 has been increased from 106 to 110 inches on all models. For the touring car the extreme length is 168 inches with the top down, and for the roadster 151 inches. The wheelbase of model 71 is 114 inches.

As to model 71, this chassis is practically the same in design as the other, except for the difference in size of the various parts, as has already been brought out. The motor, a sectional view of which is shown in Fig. 3, has a bore of 4 3-8 inches and

a stroke of 4 1-2 inches. The rating is 45 horsepower. It will be seen that its features do not vary materially from those of the other motor. The oiling, however, is entirely by splash with a pump for maintaining constant level in the crankcase. The ignition and cooling systems are similar to those on the model 69 engine. The various motor dimensions are given below:

CRANKSHAFT—FIVE BEARINGS—Front: 1 7-8 inches long; 1 1-2 inches diameter. Three center: 1 3-4 inches long, 1 1-2 inches diameter. Rear: 4 3-8 inches long; 1 1-2 inches diameter.

CAMSHAFT—THREE BEARINGS—Front: 2 11-16 inches long; 1 inch diameter. Center: 2 3-4 inches long; 1 inch diameter. Rear: 2 1-4 inches long; 1 inch diameter.

MAGNETO SHAFT BEARING—2 1-8 inches long.

CONNECTING ROD BEARINGS—Piston ends: 2 1-4 inches long; 1 inch diameter. Crankshaft end: 2 1-8 inches long; 1 5-8 inches diameter.

WRIST PIN BEARINGS—4 inches long; 1 inch diameter.

VALVES AND PUSH-RODS—1 7-8 inches clear opening; 2 1-8 inches diameter of seat. Push-rods: 4 1-16 inches long. Push-rod guides: 3 3-8 inches long.

FLY-WHEEL—17 inches diameter; 3 1-4 inches width.

Like model 69, model 71 has three-speed selective gearset, the gear ratio being as follows: High, 1 to 1; intermediate, 1.72 to 1; low, 3.2 to 1; reverse, 3.93 to 1.

This gearset is also mounted at the rear axle. The latter, however, on this model is floating, while that of model 69 is three-quarter floating. The transmission dimensions are:

REAR AXLE—Differential bearing, length 7-8 inch. End bearing, length 7-8 inch.

AXLE SHAFT—Diameter, 1 5-16 inches; length, right 32 13-16 inches; left, 32 1-16 inches.

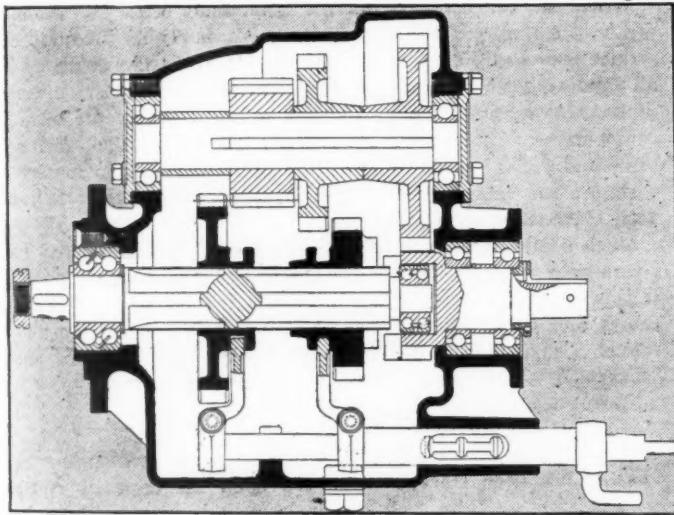


Fig. 7—Cross-section of the 1913 Overland gearset

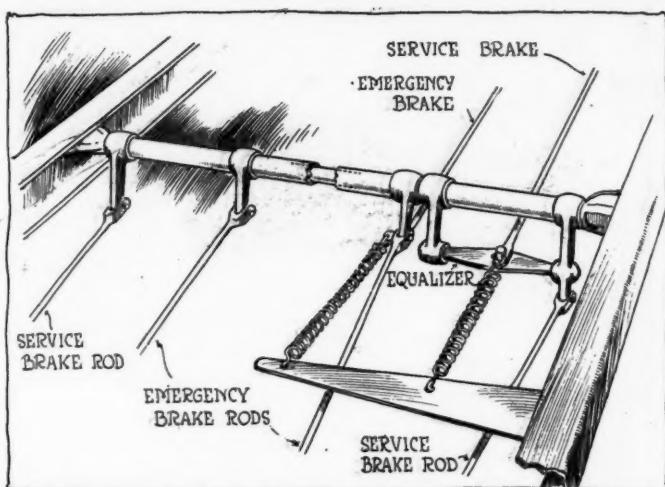


Fig. 8—Showing new brake equalizing arrangement on Overland cars

PROPELLER SHAFT—Length, 41 inches; diameter, 1 1-8 inches.

GEARSET MAIN DRIVE SHAFT—Diameter, 1 13-16 inches; length, 12 7-16 inches.

The same scheme of inclosing the drive shaft in a torque tube and bracing is used on this model as on model 69. Brakes are also identical in every respect on the two models.

As to the wheel sizes, those of model 69 are designed to take 32 by 3 1-2-inch tires on quick detachable rims, front and rear, while on the 71 the tire size is 34 by 4 inches.

Wide Range in Body Design

Eight body types are fitted to the two chassis. These consist of touring cars, roadsters, four-passenger models and coupés. The bodies have all been deepened and lengthened, while the seats have been made deeper and lower. Increased leg room has been provided in the tonneaus. As to the five-passenger touring car fitted to the model 69 chassis, this has a divided front seat and its front cushions have a width of 18 inches. The cushion depths are also 18 inches. The rear seat cushion has a width of 46 inches. The doors have been made amply wide, and door handles are placed within. The model 69 two-passenger roadster has also been somewhat changed to give it added distinctiveness and more rangy appearance.

Model 71 bodies are similar to those furnished on model 69, but being more expensive are, of course, somewhat more refined. Running-board tool boxes and kits are provided, which

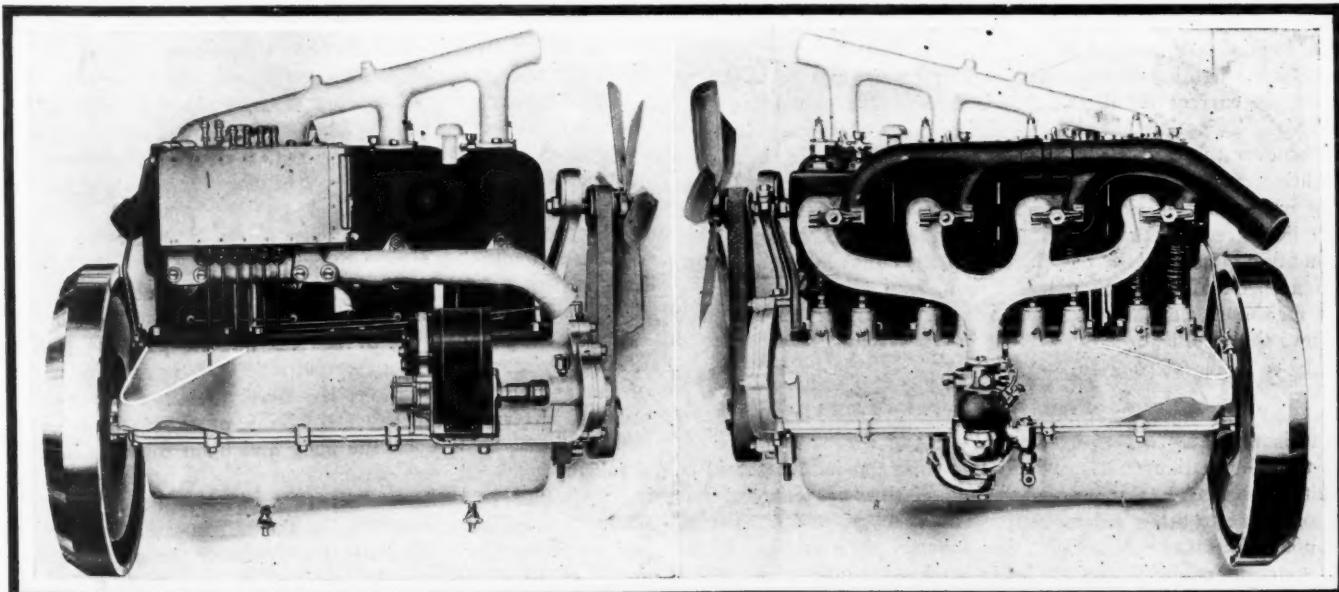


Fig. 9—View of both sides of the model 69 Overland motor, showing magneto, carburetor and mechanical oiler

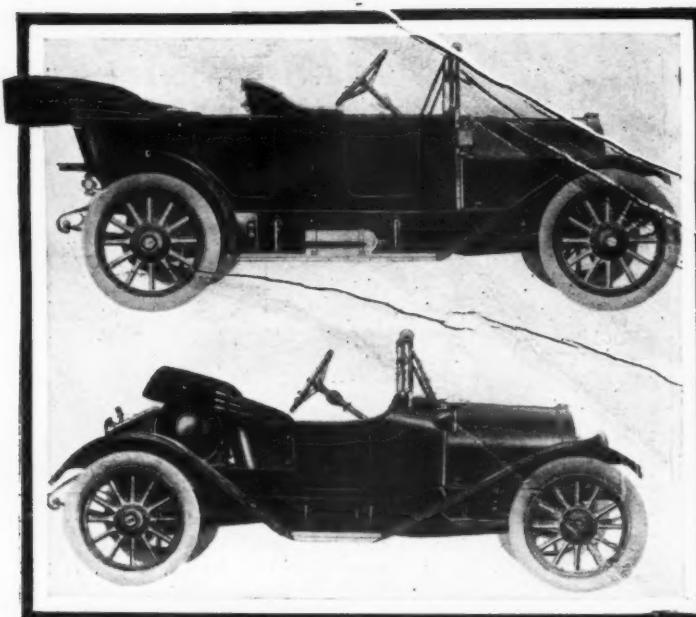


Fig. 10—Model 69 touring car and model 71 Overland roadster

give the clean running-board appearance, and at the same time afford ample room for all supplies. The roadster does not have these running-board boxes, but there is a slanting-top box mounted at the rear of the seat back of the gasoline tank. Tire irons are provided on top of this rear tool box on both roadsters.

The price for model 71 has been fixed at \$1,475, while that of model 69 is given as \$985. The \$85 increase in the price of the cheaper model is accounted for by the fact that model 69 carries full equipment, while model 59 for 1912 did not. The 1913 model has a mohair top and top envelope, windshield, speedometer, gas tank and self-starter as added equipment, compared with what its predecessor carried for its price of \$900, so that the new model is really cheaper when everything is considered.

All cars this year with the exception of the coupés are fitted with Prest-O-Starters, which operate in connection with the Prest-O-Lite acetylene gas tanks, and the construction and operation of which has been explained in previous issues of *THE AUTOMOBILE*. The coupé models, when so ordered, are fitted with self-contained electric starters, the motor-generators of which take the place of the flywheels. This starting apparatus is manufactured by the United States Light & Heating Company, of Niagara Falls, N. Y. The device also furnishes current for lighting all lamps.

Electric lighting is a standard equipment feature of model 71 cars, the current for these lights is furnished by a lighting generator. This operates in connection with a storage battery. Whenever the car's speed is in excess of 10 miles an hour, the lighting current passes directly from the generator to the lamps, but when there is more current produced by the generator than the lights require, the excess passes to the storage battery. This condition obtains in the day time when the lamps are not lighted. At a speed of about 18 miles an hour, the generator produces its maximum current of 10 amperes. An ammeter on the dash shows the condition of the current in the system.

Cold Is Not Good for Tires

It is well known that heat and light and decidedly injurious to tires, but a thing not so widely known is the fact that cold is quite as harmful to tubes and casings if they are exposed for a long time to a low temperature. The effect of cold upon tires is not unlike that of cold on other substances; iron pipes burst in extreme cold; tires first begin to harden, then lose their resiliency and finally become fragile and crack. This shows the advisability of keeping tires in a dark, dry place, with a uniform temperature of about 60 degrees Fahrenheit.

Revarnishing The Car

Carefully Touch Up the Bad Spots with Proper Color Before Beginning the Operation

Chassis and Mud Guards Will Need Renovation, Too—Advisability of Coloring Brass Parts

After treatment of water baths, renovators, surface elixirs, varnish restorers and the other liquid contraptions has been exhausted and the varnish refuses to longer respond to the cleaning and "doctoring," it is high time that the car be turned over to the painter with the admonition to "tune her up."

Varnish reaches a day when coating and renovating methods and even the prayers of just men no longer avail. In this emergency the automobile painter comes to the rescue and with much necessary cleaning and fussing and the application of paints and varnishes in adequate measure makes the car look like new throughout.

When the car comes from the paint shop with the radiant depth of the mirror reflected in its finish, it begins a course of service sufficiently erosive in its nature to fetch the depth of it all down to a mere glaze, at which point of decline nothing short of touching up and revarnishing will suffice to please the owner.

The days of the motor car finish are, as a rule, comparatively brief and full of trouble. It is constantly exposed to a variety form of service which includes doping, cleaning and rubbing until eventually it succumbs.

Much of the clearing and rubbing and the application of revivers goes on after the varnish has lost all recuperative power. It is without any capacity to feed upon the cleaners and renovators, and show any appreciable effect from the nourishment.

Such a surface is even a bad one to bring out under one coat of varnish, a single coat being insufficient nourishment.

Preparing Surface for Varnish

The surface, in fact, may be described as varnish-hungry. It has been starved while fed upon the dope of cleaners and feeders. This lack of nourishment is in most cases inexcusable. The car owner should know, even if he should be invited to sit at the feet of the painter and learn, that after 6 or 8 months' wear in the strife of modern service, maltreated and scrubbed until its life has been threatened a score of times, the average car varnish is in a condition to be replaced.

To be sure, comparatively few cars get the fresh coat of varnish, but this neglect simply adds emphasis to the statement that they all should get freshened up with a new supply of luminous material considerably oftener than the present practice provides for.

To renew the finish by adding a single fresh coat of varnish is not an expensive treatment and it should not take the car long out of service.

To condition the finish in this way proceed about as follows:

Do as little unhangng of the car and its parts as possible. Clean the interior of the car out well and cover with a piece of canvas or other like material. Wash the body thoroughly in order to determine the exact condition of the varnish. There will be grease spots upon the body and upon the chassis which should be removed with waste saturated with turpentine. Failing with this, rub with a strip of broadcloth rolled up in the shape of a cylinder, after dipping the roll in water and pulverized pumice stone. This method will remove the grease spots in short order. Then rub the surface all over with a felt pad dipped in water and pumice stone flour. This treatment clips off the motes of dirt and makes everything clean and smooth to receive the new coat of varnish.

Naturally, there will be spots in the color that will need touching up and matching up with the old color. This is an operation that very few men can perform successfully. The car owner may be quite as adept in getting the color tone and shade as the painter, and in some cases more so, merely because he may possess color sense, without which no one need hope to succeed in the work.

The eye for color is a gift, not an acquirement. In touching up confine the work to precisely the spots worn or nicked off, or disfigured in other ways. Touch only the blemish, and do not let the color splash over parts of the surface in perfect condition. It is very rarely the case, to be candid, where the match of the new color with the old is so perfect that it cannot be detected. For this reason touch only the diseased or imperfect surface space.

This work now having been attended to, the next step consists of applying the varnish. No one but the experienced painter or varnisher can hope to do this work upon the fine and beautiful surface of the motor car with any degree of success. It requires professional skill and brush expertness, and an intimate knowledge of varnish in all its fitful moods, to flow the surface and cause it to look like a mirror from Paris.

Touching Up Chassis and Fenders

The layman may paint his car, but when he comes to varnish it, that is quite another story.

The finishing coat of varnish should always be flowed on plentifully. Lay it out with brush strokes lengthwise of the panels, cross brush, and again brush it lengthwise of the panel surface. All this appears very simple, and it really is so, but there is the practice and the know-how back of it.

Bring the chassis along in practically the same way that the body surface is attended to. In touching up both body and chassis preparatory to varnishing observe this rule invariably: Use the color with sufficient varnish in it (added after thinning the color with turpentine) to cause it to dry with a gloss. The theory of this is that the color with strong luster to it reflects more light than it absorbs, in which case, in drying out, it does not change in tone or shade, whereas the color containing no luster, and drying dead, as the term is, absorbs enough light to not infrequently change it a shade, and perhaps several shades, from what it appeared to be in the mixing kettle.

The fenders or mud guards should, of course, be brought along with the body of the car. The lamps and brackets, etc., if in color, should get at least a coat of varnish color or enamel, and if a baking oven is handy this varnish color or enamel should be baked on.

If of polished brass, the parts will need polishing up, but if such parts have been lacquered it will be necessary to first remove the lacquer. This may be accomplished by mixing 1 pound of caustic soda in 3 gallons of water and applying to the brass with a soft wool sponge tied to a stick. Use this solution with care and avoid smearing it on other parts of the surface. Rinse off with clean water, after which treat it with some good metal polish. All of the brass parts after cleaning and polishing should be coated over with lacquer or lacquer substitute, which latter may be made by thinning pale elastic automobile body varnish with turpentine or by using a thin coat of white shellac.

Lacquered brass becomes dirty and discolored through use and often appears tarnished when in fact it is merely dirty. Rubbing smartly with metal polish under a woolen cloth will remove the dirt and restore the surface to its original condition.

The advantage of having these parts finished in some selected color, blue, green, black, maroon, and so on, is that they may be maintained in presentable condition at less expense than in case of the brass finish, and in the matter of refinishing the cost is considerably less. Moreover, from an artistic standpoint the color finish, if in harmony with the field color of the car, loses nothing by comparison with the blazing brass surface.

The varnished car is not complete until the radiator has been brushed, and cleaned, and treated with a thin coat of asphaltum,

Too Many Patents Issued

Commissioner Moore Says That a Large Percentage of Them Should Not Be Granted at All

With \$500,000 the Office Could Guarantee Novelty of Every Patent Issued

WASHINGTON, D. C., Aug. 3—There are no industries in the country more vitally interested in the matters pertaining to the United States patent office than the motor car and accessory industries. To all those connected with these industries it will come as a distinct surprise that Commissioner of Patents E. B. Moore has come out with a statement to the effect that a large percentage of patents issued by the patent office should not be issued at all. Commissioner Moore made this declaration in discussing the proposed investigation into the methods and personnel of the patent office.

Indorsing all the claims made by Representative Bulkley, as to the needs of the patent office and the evils which it is alleged exist in the department under his charge, Commissioner Moore said that a half million dollars would remedy every existing abuse and place the office on a modern business footing, under which the government could guarantee the novelty of every patent issued. Commissioner Moore defended the men who work under him, but he admitted the truth of the statement that no sooner had a man been trained to some position with the patent office than he would move into some business for which his training had fitted him, and which paid him double and often treble the government salary.

"I would not care to say 50 per cent., but a large percentage of the patents which are issued from this office are not good patents and should not be issued," said the commissioner. "Yet what can one do under the condition with which we work? We have not the men nor the equipment to conduct the searches and it is only natural that a great deal should be overlooked, which would not be the case if we had the improvements for which I have asked during the past five years. If these things are granted to us, it would enable the patent office to make the search so thorough that the government would be able to guarantee at least the novelty of the patent, as is done by the German government. Then the patentee can be sure that his patent is at least original.

bronze, graphite or some dark mineral paint qualified to stand heat and wear hard and long. No thick or heavy-bodied pigment should be used on the radiator and the car owner may wisely insist upon the use of only very thin coats of material for these parts.

Attention should always be given the top as the car goes through the shop. If only a mohair top, it deserves a brushing to eradicate the dust and dirt and bring out the good points of the material. As a rule, the car top gets about the worst sort of neglect.

For the dirty leather, rubber or Pantasote top, the outside finish requires washing with a weak solution of castile soap. In course of time if the leather or rubber becomes worn and looks permanently "dingy" it should have a thin application of some reliable dressing, formulas for which have been given in previous issues of *THE AUTOMOBILE*. The bows of the top need a finish to correspond to other parts of the car. They should be cleaned perfectly from impressions of the hands, and finally, before recoating, washed off with turpentine. Then coat them in with a clean, full application of varnish color. In the event of the bows being found "nicked," and the finish fractured and possibly chipped off somewhat, a coat of flat color should first be put on, the varnish color to follow.

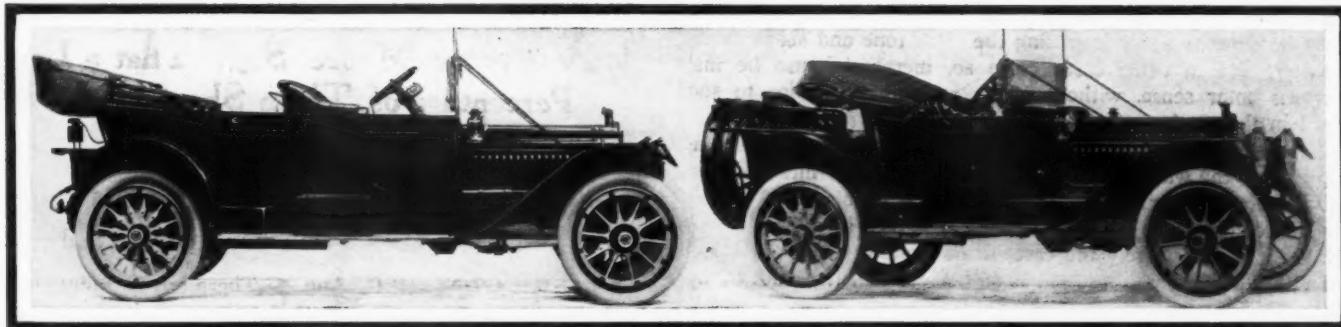


Fig. 1—Packard 38 phaeton Little Six

Fig. 2—Packard 38 Little Six runabout

Packard Announces 1913 Little Six

Left Drive and Control; Positive Starter, Combined with Electric Lighting and Ignition Are Features

Convenient Control Board on Steering Column Within Easy Reach of Operator's Hand

THE Packard Motor Car Company will have for delivery within a month a small six-cylinder machine, which will be known as model 38. It will be furnished in any desired body type at prices ranging from \$4,050 for the runabout to \$5,400 for the imperial limousine, which has seating accommodations for seven. The touring car and phaeton types will be sold at \$4,150. The wheelbase of the touring car chassis is 134 inches; of the phaeton, 138 inches, and of the runabout, 115 1-2 inches.

While in general appearance and most details of construction the new six conforms to previous Packard design, several of its features are decidedly new to cars of this make, and they mark what might be termed a new Packard era. These more or less noticeable changes from the details which have been accepted as part of Packard cars of the past are the adoption of left-hand drive and control, electric self-starting, and the distinctive feature of using a control board mounted on the steering column, which carries all the switches and buttons connected with starting, ignition, lighting, as well as the carburetor adjustments.

The left-hand drive and control feature is perhaps the most significant change which has been made and marks the entrance of this company into the ever-increasing ranks of the left-hand drive users. The reasons given by the Packard company for this adoption on its newest creation are that it did not wish to adopt the left drive until it had developed a starting system which would be positive, since the car operator would have to get out into the road to crank his motor and might just as well go the rest of the way around the front of the car to get into the driver's seat. But now that it feels that it has added a starter which is positive, there is no reason why left drive should not be used, since the driver is now enabled to reach his seat and start the motor without stepping into the road.

Combined Starting, Lighting, Ignition

The starting system, of the Delco type, is in combination with the electric lighting and ignition systems. The outer rim of the flywheel has teeth cut in it, with which the gear of the electric motor-generator meshes when the crankshaft is to be revolved by electric energy for starting. The motor-generator is normally a generator, and runs only temporarily as a motor when required for starting. This electric system has been taken

up in detail on several occasions in these columns, but a brief description of its operation will not be out of place here.

In addition to the combination of electric system there is a set of dry cells, which are used only for furnishing ignition current when the motor is first started. After the engine is running, the operator switches to the generator current. The reason for the use of this auxiliary set of dry cells is that in starting the storage battery is drawn upon to furnish energy for operating the electric starting motor, and should this battery be required to furnish ignition current as well the spark would be weak. After the engine is running, however, this extra drain of starting is not made, and the storage battery and generator are ample for ignition purposes. The dry cells may also be used in emergency, should the other electric apparatus get out of order.

To start the motor, the driver pushes the starting button on the control board and presses down on the clutch pedal. This automatically meshes the teeth of the generator gear with those on the periphery of the flywheel and current is drawn from the storage battery to drive the generator as a motor, thus turning the crankshaft. After the engine is running under its own power, the operator releases the starter button and throws the ignition current switches so that the dry batteries are no longer required. The generator then runs as a generator and supplies ignition current, any excess amount developed being passed to the storage battery, which has a capacity of 80 ampere-hours. The running ignition system is of dual type. A transformer coil is used in connection with it, while the same set of spark-plugs is common for both it and the auxiliary system.

Control Board a Convenience

For lighting, the current is supplied from the storage battery when the motor is not running, but when the engine has attained a speed of about 200 revolutions per minute the generator furnishes the current.

The battery and battery controlling device are located on the right running board, while the generator is on the left rear side of the engine and is driven by inclosed gears.

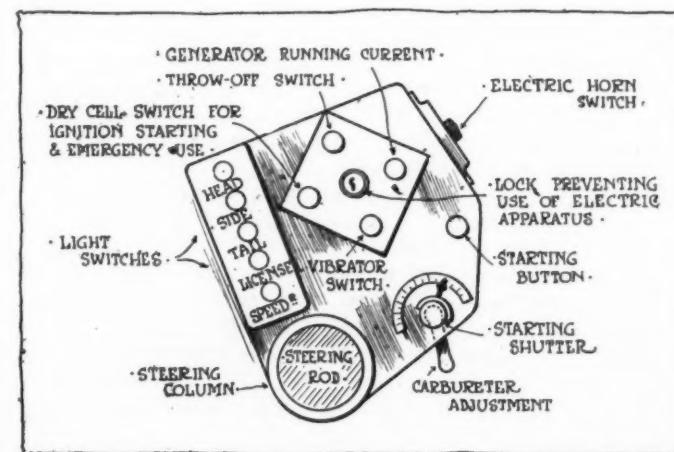


Fig. 3—Plan view of control board located below steering wheel

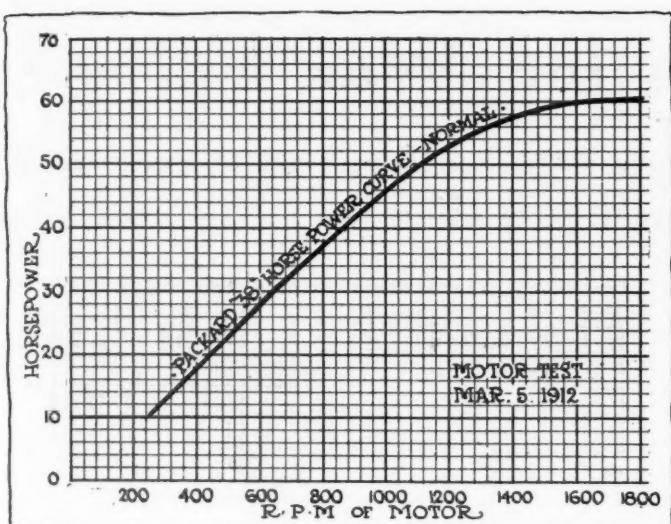


Fig. 4—Chart showing high horsepower developed by Packard 38

A sketch of the control board, which is an entirely new apparatus and never before used on any machine, is given in Fig. 3. It will be seen that every feature of the car's running is brought within easy reach of the driver's hands. It is rigidly fastened to the steering column. This column is stationary, the steering rod turning within it. The location of the control board below the steering wheel is clearly shown in the body illustrations. A single cable running up the steering column carries all the wires from the various electrical apparatus to the switches. Placing these devices here leaves very little on the dash. Speedometer, oil and air pressure gauges and priming buttons are practically all that remain there. The sketch is self-explanatory. A lock is provided so that the car may be protected against indiscriminate use. This lock puts all the electrical connections out of use when desired. A button conveniently located on the dash within reach of the driver's foot is for use in cold weather for priming the cylinders with acetylene gas and thus facilitating starting. Pushing this button injects the gas into the cylinders. For this purpose a special acetylene gas tank is carried, and is seen in the body views at the lower rear corner of the hoods. Referring to the control board sketch, it will be further seen that there is an indicator which shows the relation of air to gas in the carburetor. This carburetor adjustment is operated by a small handle just below the control board and which is seen in the body illustration. The starting shutter button is used to throttle the air supply to the carburetor to facilitate starting the motor. This shutter is operated by pulling up on the button marked.

Motor Differs From Big Six's

The new 38 motor is different from that of the larger six-cylinder Packard car in that it is an L-head type and the valves are all on the right side. The Packard 48 six-cylinder motor is a T-head type. The cylinders are cast in blocks of two each, and another new feature of the 38 design is the complete inclosing of all valve springs by removable cover plates. Since the carburetor is placed on the left side of the motor and the valves on the opposite side, a new form of intake manifold construction is used. This manifold, on leaving the carburetor, passes into three branches and these run between each pair of cylinder castings to the cylinder inlet connections.

As indicated by the model designation, the horsepower rating is 38 according to the S. A. E. formula. The stroke of the new motor is 5 1-2 inches and is the same as that of the larger Packard six. The bore is 4 inches, giving a ratio of 1.375. Referring to the horsepower chart, shown in Fig. 4, it will be seen that the maximum horsepower developed is 60 at about 1,600 revolutions per minute. The rated horsepower of 38 is attained at about 800 revolutions, which appears to be very much below the average power of the motor.

The carburetor on the new six is the same as that of its larger predecessor and is characteristic of Packard design. It is provided with a hydraulic governor which makes use of a diaphragm. The pressure of the water system is directed on one side of this diaphragm, while the other side is connected with the throttle of the carburetor. The greater the speed of the engine, the greater the consequent water pressure on the diaphragm and the greater its outward bulge. By its connection with the throttle, this bulging partially closes the throttle and acts to slow down the motor somewhat, thus performing its function of uniformly governing the motor speed. However, on the new six, while the same governing principle is maintained, the water pump and governor are separate and not combined as in the other model.

The lubrication system is identical in all its principles with that used on the 48 six-cylinder motor. The lubricant is fed by pressure from an eccentrically-driven force pump to all the crank-shaft bearings and to the upper and lower bearings of the connecting-rods. In addition to this positive oiling of the bearings, an auxiliary lubricating system connected to the carburetor throttle operate so that when the engine is under heavier load and doing more work, it will get greater supply of oil and vice versa. This auxiliary scheme feeds oil to each of the cylinder walls and the leads from these cylinder openings are connected to the main lubricating system through a check valve. The crankshaft is drilled from end to end to provide a passageway for the lubricant. The lower part of the crankcase furnishes a reservoir for the collection of the oil, from which point it is positively forced by the pump to all the bearings. The splash arrangement which is found in many other American motors is absent in the Packard design.

Fuel Tank Located at Rear

In keeping with the system adopted on its other cars this year, the Packard company has adopted the rear-tank arrangement on the new 38. The gasoline is supplied to the carburetor under about 2-pound pressure maintained by an automatic pressure pump on the motor in connection with a large hand pump on the front seat heel board. This latter is used for the initial pressure. A gauge on the dash indicates the pressure within the tank, while a magnetic gauge on top of the tank tells the supply of fuel contained, the maximum capacity of tanks for all body types being 20 gallons.

The motor is cooled by the conventional system of cellular radiator and centrifugal water pump, located on the left side of the motor and driven by inclosed gears. The cooling fan is belt driven and has a type of belt-tension adjustment. The capacity of the water system is 6-2 gallons.

The clutch is of multiple disk type, as on the other Packard models. There are five lined driving plates and four steel driven plates. The clutch brake, which is attached to the clutch pedal, aids in gear shifting. The clutch rear bearing is supported by an integral extension of the crankcase and a cover arrangement completely incloses the clutch.

The Packard two-unit principle in which the motor unit comprises the motor and clutch, and the rear axle unit takes in the transmission gears, differential and final drive, is maintained. The power connection between the two units is an amply large drive shaft which is provided with two universal joints. The gearcase bolts by a flange to the rear axle housing. There are three forward speeds and a reverse, the gear-shifting lever having a selective action in the standard form of Packard single quadrant. The gear shift lever and the emergency brake lever are placed at the driver's left, just inside the left front door, to be in keeping with the left-hand steer.

In the new 38 no change from the Packard 48 construction is to be found in any of the running gear features, the frame, brakes, springs and axles presenting the same general appearance in the two cars. The spring sizes are given below:

Front springs: 40 by 2 inches; semi-elliptic.

Rear springs: 51 by 2 inches; three-quarter scroll elliptic.

The frame is of pressed steel, channel section, and arched

France Tests Trucks for War Purposes

Vehicles Not Bought Outright, but Subsidized by Government

—Trials Tend to Standardization

Strict Examination Follows 1,558-Mile Road Test, for Which Sixteen Firms Offered Their Latest Models—Economy Considered.

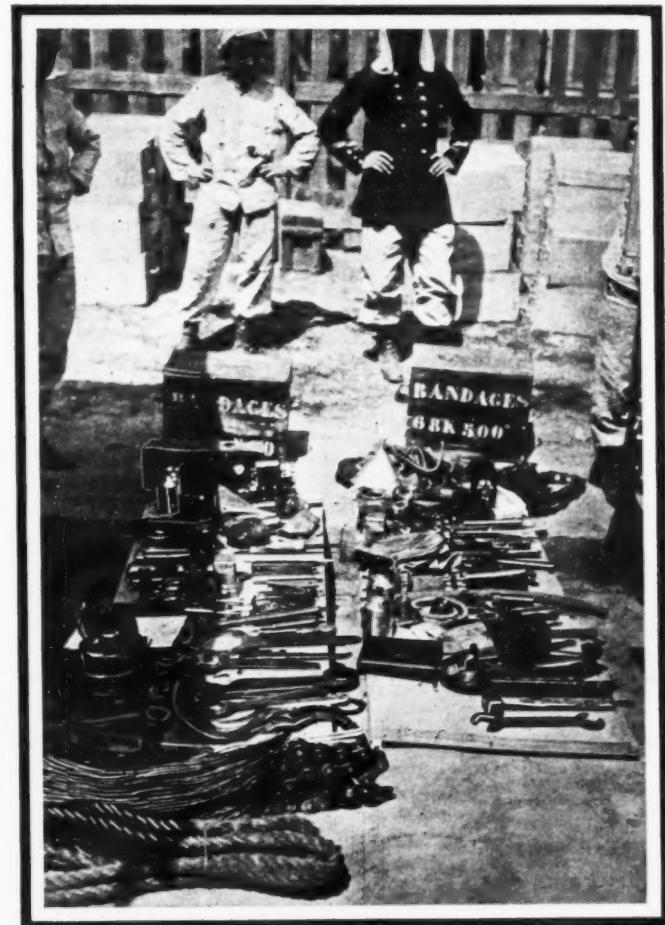
PARIS, Aug. 11—Military France prefers to subsidize privately-owned motor trucks rather than maintain a large fleet of vehicles which can never be fully employed except during general manœuvres or on the outbreak of war. By offering \$600 at the time of purchase and \$200 for each of three following years it is possible to have at the disposition of the army whenever needed a very large and perfectly maintained fleet of motor trucks. But before the private owner can enter into the subsidy agreement with the government, the manufacturer must have the type of vehicle approved after strenuous tests on the road and close examination at the hands of technical experts. As new models are brought out every year, these army trials are now an annual event, and as it is to the advantage of every manufacturer to be able to offer his trucks to the public with the possibility of a subsidy, all the latest types of commercial vehicles are found in the trials. Probably, without the public being aware of it, the army has a greater influence in determining design and development of commercial motors than has the private user. Yet the army makes very few direct purchases. It has the first call, however, by reason of the new models being presented to it for test and examination with a view to participation in the subsidy scheme. The army requirements have tended to standardize wheels and tires, bodies and body fittings, under clearance and track; they have made radiator protectors an essential, they have insisted on hooks front and rear for hauling purposes; they have cut down gasoline consumption and arrested oil wastage, and they have done more than the demands of the private user to develop accessibility.

This year's tests have just been brought to a close. They consisted of 1 month under observation, during which the competing vehicles had to make twenty distinct daily runs over routes radiating from Versailles, the total distance covered being 1,558 miles for ordinary trucks, and 1,225 miles when a trailer was hauled.

above the rear axle. It is extended back to protect the gasoline tank and to afford a hanging for it. To allow for a short turning radius the frame is narrowed in front. The front axle is of heavy I-beam section, while the steering knuckles have integrally forged yokes. The rear axle housing is of heavy-gauge pressed steel and it is riveted within flanged collars which are bolted to the internally ribbed aluminum rear-axle housing.

The brakes are of the conventional type of internal and external expanding designs and are of ample size. Bayonet locks are provided on the internal brakes to prevent rattling.

As to the standard equipment which will be furnished with the new six, this includes top and side curtains, top envelope, windshield, electric headlights, combination oil and electric side and rear lamps, license light, horn, tools and tire-repair equipment. All the inclosed bodies are to be fitted with dome lights and switches, speaking tubes and so on. In general, it may be said that while a number of mechanical differences have been incorporated in the new car, the bodies on all Packard cars present similar characteristics.



Spare parts of two cars laid out for inspection

The runs had to be made under full load both singly and in convoy formation, without load, and with gasoline, benzol and alcohol as fuels, the army authorities evidently anticipating a shortage of the usual gasoline supply in time of war. An officer was carried as observer on every vehicle, and very careful control was kept of fuel and oil consumption, for it was on running economy, reliability and absence of wear that awards will be made which will entitle the models to be classed as subsidized types. This year there was no failure on the road; but mere ability to cover the distance is not sufficient, and when the road portion of the trials was over, a very close examination was made of the working parts. This was not a superficial look-over, but consisted of dismounting rear axles, jackshafts, gearboxes, road wheels, motors, steering-gear, etc.

Thirty-two Models in Trials

The French trucks taking part in the trials are really representative of the national industry. This year, for instance, sixteen of the leading home firms entered their latest models, the total number of competing vehicles being sixty-two, representing thirty-two distinct models. Although the army stipulates the body sizes and insists on a certain ratio of dead

weight to useful load, there is no decided preference for either the motor-under-the-bonnet or the motor-under-the-seat type. This year the bonneted type was in a slight majority, but while certain firms, Saurer at the head of them, claim that the motor should be in front of everything, such leaders as Renault, Berliet, De Dion Bouton, Delahaye, Bayard-Clement, build both types.

From an American standpoint an important feature of the French trucks is the small size of the power plant. In every case four-cylinder motors were employed, but in only a few cases did the cylinder diameter exceed 4 inches. A very common dimension for 3 to 3 1-2-ton trucks was a cylinder bore of 3 to 3 1-2 inches. There is a tendency, too, to make one type of motor do duty in different chassis designed to carry loads varying from 2 to 3 1-2 tons. The explanation of the small motor can, of course, be found in the high cost of gasoline in France. Last year, in calculating running costs, the price of gasoline was taken at 33 3-10 cents per gallon. This year it is still higher. In motor design there is not any great departure from touring car practice, and except that a lower number of revolutions is aimed at the touring and the truck models hardly differ. For the most part the motors are of the L-type, with fixed point high-tension ignition and either pressure feed or circulating oil systems. The unit system is not favored, being found on only two types: the Latil, which drives to the front wheels, and the new La Bure truck. The Latil is distinctive by reason of a considerable use of bronze alloy castings in place of aluminum, this latter metal being used only for such parts as timing gear housings, oil base, gearbox cover, etc. The Latil motor is a good example of the simplicity that is being aimed at by the French manufacturers. This motor has the valves on one side, the intake, exhaust and water pipes being made in the casting, and while the base for the magneto is made with the crankchamber, there is a flange on one side of the cylinder casting through which is screwed a bolt with locknut to bear on the top of the magneto and hold it to its platform.

Economy Plays Important Part

In the majority of cases the makers apply to the specialist, such as Claudel, Zenith, G. & A., Solex, for their carburetors. The regulations stipulate that gasoline benzol and alcohol shall be used without a change of carburetor. Practically no change is required to use benzol in the place of gasoline, but to properly vaporize alcohol a considerable amount of heat is required. For this purpose nearly all the carburetors are amply water-jacketed, with provision for turning on the flow of water only when required for running on alcohol. The results obtained are not the best, but as alcohol has no commercial use in France for internal combustion motors, the compromise is satisfactory. The rigorous control of lubricating oil and grease in these trials has led to consid-

erable care being exercised to secure economy. Pressure feed to the main bearings and connecting-rod ends and the pump driven circulating system are about equal in numbers. But of equal importance with the actual lubricating system is the necessity of preventing leakages through the tappet guides, crankcase breathers, the ends of the bearings and the joints of the gearbox and rear axle.

Among the new mechanical features shown on the trucks is a special type of frame member employed on the Clement-Bayard chain-driven models. At the point where the jackshaft passes through the frame member the latter is considerably increased in depth, the top line of the frame being straight, but the bottom line given a considerable downward sweep. Thus the total depth of the frame member at this point is about three times that at any point. Obviously this gives increased strength at the point of the frame receiving the bracket for the jackshaft bearings and the forward end of the rear spring. The frame is trussed, the truss rod passing around this downward sweep of the frame. On these models the gearbox is mounted immediately behind the cone clutch, and a propeller shaft carries the drive to the jackshaft. The differential housing is practically of the same type as used on the firm's touring cars, and is bolted to a couple of transverse frame members, one in front of it and one to the rear of it. Unlike some of the smaller models, where the jackshaft is practically of the same design as a touring car rear axle, there is no casing for the two portions of the transverse shaft. Each shaft carries near its outer extremity a brake drum lodged within the face of the frame member, the increased depth at this point making this possible. On some of the other models, notably Delahaye and Peugeot, brakes are fitted at this point, but in both cases the drum is on the outside of the frame, or between the sprocket and the frame. On the Clement-Bayards, with a view to giving accessibility to the brakes, there is a coupling on each half of the jackshaft. All of the Clement-Bayards are fitted with pressed-steel road wheels, this being a type of wheel which up to the present has



The Berliet entry was equipped with rubber tires on the front and steel tires on the rear wheels

Front-drive Latil truck performed satisfactorily
Clement-Bayard truck—note frame construction



One of the trucks submitted by Schneider & Co.

New shaft-driven Saurer truck stood up well

not been considerably adopted in France. During the trials it gave very satisfactory service.

La Buire had in the trials a new 2 1/2-ton model, shaft driven, with canted rear wheels. Unit construction is adopted for the motor and gearbox, the crank chamber having a rearward extension which encircles the disk clutch and has bolted to it the four-speed gearbox. On an extension of the propeller shaft, to the rear of the axle, the foot-operated brake is mounted, the hand brakes being in the usual position on the road wheels. A double reduction is employed in the rear axle; this consists of two spur pinions, one of which is mounted on the same shaft as the crown bevel wheel, and the other on the differential shaft. In principle, though not in the same detail, this has been adopted by several other French firms for both touring and commercial models. These trucks are also fitted with oscillating hubs for the steering wheels. This invention, while giving perfect lateral stability, allows the wheel to articulate in a vertical plane. It consists of a central hub, with the wheel revolving on a centrally-located pin attached in the usual position, but being mounted on the stub axle below the main journal. The result is that the weight of the vehicle is carried by the wheel below the main journal, leaving the wheel free to articulate in a vertical plane about this lower suspension. Briefly, the construction of the wheel consists of a steel hub pierced in its center for the passage of the axle pin. The spokes are mounted on this hub in the usual way, and in the interior of the hub is a single steel plate bored to provide two distinct bearings; the

upper one is the axis of rotation, the lower one receives the stub axle and is the axis of oscillation. The wheel, which is the invention of M. Genillon, appeared to give satisfactory service in the trials. The usual type of muffler was not fitted on the La Buire cars. In its place there is a long, big-diameter pipe—probably 3 inches in diameter—attached just below and slightly within the frame member, and terminating in a small-diameter pipe discharging at the rear.

Saurer competed with a shaft-driven model, the vehicle being a new 2-ton truck, but all the larger types were retained with side chains. Shaft drive was in a decided minority, the firms adopting it being Schneider, who builds most of the Paris buses; De Dion Bouton, La Buire, Berliet for one model only, and Renault. At the end of the Renault shaft a bevel pinion meshes with a crown bevel wheel carrying on its shaft a spur pinion engaging with a larger spur pinion on the end of the left-hand axle shaft. On the continuation of the propeller shaft, to the rear of the differential, there is a second bevel pinion meshing with another crown bevel wheel, also carrying on its shaft a spur pinion in engagement with a larger pinion mounted on the extremity of the right-hand axle shaft. Obviously, the two extremities of the forged axle are bored out to receive the drive shafts. Instead of the usual type of spring shackle, Renault makes use of a sliding block, consisting of a hanger bolted to the lower side of the frame member and having two grooves into which the sliding piece mounted on the shackle bolt is received.

Many Steel Tires in Evidence

Serious attempts have been made by French makers to abolish the use of rubber tires for commercial vehicles, and in the army competition the use of steel rims gives a decided advantage, for the cost of the wear and tear of tires is estimated by the jury, and this cost must always be lower for steel than for rubber ones. Steel-shod wheels, however, were present in smaller numbers than usual, and no vehicle came successfully through the trials with steel rims on all four wheels. In a number of cases the front wheels were shod with rubber and the rear ones fitted with steel tires, Delahaye, Berliet and Latil adopting this combination. This latter firm, having the entire power plant over the front axle, there being no mechanism to the rear of the driver's seat, was fully justified in employing steel-shod wheels at the rear, but in other cases the results were not satisfactory. When running without load the temptation was to speed, with the result that the vehicles danced about on the road, play set up in the spokes of the wheels and the mechanism suffered. Wheels are still the weakest point of the trucks, many having had to be patched up on the road in order to complete the test. In a few cases tires gave way, breaking up completely and having to be changed. Spare rubber tires had to be carried, their weight being considered as useful load, whereas all other spares were weighed in with the empty vehicle, but as in most cases it was not possible to fit them without the use of a hydrau-

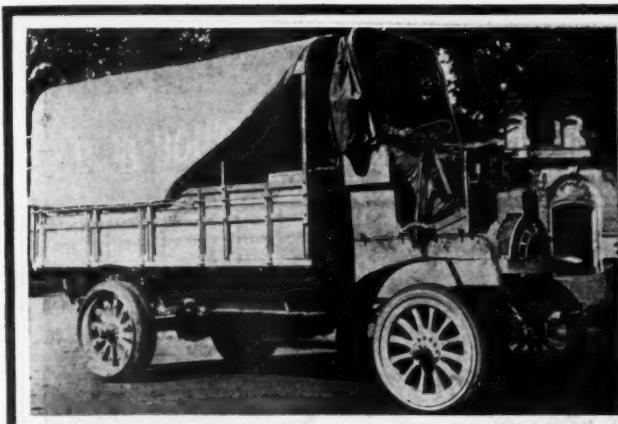
OFFICIAL OPERATING COSTS OF FRENCH TRUCKS HAVING QUALIFIED IN 1911 ARMY TRIALS UNDER THE SUBSIDY SCHEME

The cost of operating was based on fuel at the following prices:

Lubricating oil.....	58 1-2 cents per gallon.
Grease.....	8 1-5 cents per pound.
Gasoline.....	.33 3-10 cents per gallon.
Benzol.....	.22 1-5 cents per gallon.
Alcohol.....	.36 cents per gallon.

	Distance in Miles	Weight Empty Pounds	Total Weight Pounds	Useful Load Pounds	Cost per Kilometer Car in Francs	Cost per Ton-Kilometer in Francs
De Dion Bouton...	1,569	6,856	14,528	7,672	0.101	0.029
Malicet & Blin....	1,569	6,767	11,971	5,204	0.140	0.059
Aries.....	1,569	7,341	15,057	7,716	0.154	0.044
Renault.....	1,569	6,900	13,227	6,326	0.124	0.043
Dietrich.....	1,569	7,363	13,778	6,415	0.145	0.050
Delahaye.....	1,569	5,665	10,934	5,268	0.074	0.031
Delaugere-Clayette.	1,569	6,778	12,543	5,784	0.134	0.051
Berliet.....	1,569	5,676	10,163	4,596	0.078	0.037
Vermorel.....	1,569	6,800	12,984	6,183	0.134	0.048
Front drive Latil...	1,569	7,259	14,440	7,179	0.121	0.037
Peugeot (truck)....	1,569	6,194	11,353	5,158	0.074	0.031
Clement-Bayard...	1,569	5,798	11,397	5,559	0.091	0.035
Saurer, tractor....	1,255	8,598	15,211	6,613	0.206	0.020
Aries, tractor.....	1,255	12,147	17,526	15,432	0.393	0.041

Cost is given in francs. About three-quarters of distance was covered under the full load and one-quarter empty. No account is taken of tire wear. The kilometer is, roughly, 5-8 mile. The franc is 20 cents.



Shaft-driven De Dion Bouton truck



Renault entry, which had a distinctive drive

lic press it was difficult to see their utility aboard. Torrihon had a system by which it was claimed that tires could be changed on the road, this consisting of a detachable rim with studs on its inner face passing into grooves on the fixed rim. The same firm had also a quick-detachable arrangement consisting of a U-section fixed rim on which the ordinary rubber tire was mounted and secured in position by means of four circular section rings—two on each side—levered into position in much the same way as a pneumatic tire is levered over its rim. Put into

position, these rings filled up the space between the walls of the fixed rim and the rubber bandage, and entering into a groove on this latter prevented it being pulled off. Rubber block tires were not admitted by the army authorities. Metal wheels did not find much favor among the French manufacturers. Clement-Bayard made use of pressed-steel wheels; Peugeot had tubular cast-steel wheels, but all the others had heavy artillery wood type. In some cases an extended flange was given the steel rim, with the object of protecting the walls of the rubber tire.

Calendar of Coming Automobile Events

Shows, Conventions, Etc.

Aug. 24-Sept. 9....Toronto, Can., Display of Automobiles, etc., at Canadian National Exhibition, Transportation Building.
 Sept. 17-20.....Denver, Col., Convention International Association of Fire Engineers.
 Sept. 23-Oct. 3....New York City, Rubber Show, Grand Central Palace.
 Dec. 7-22.....Paris, France, Paris Automobile Show, Grand Palais.
 Jan. 4-11.....Cleveland, O., Annual Automobile Show.
 Jan. 11-25, 1913....New York City, Thirteenth Annual Show, Madison Square Garden and Grand Central Palace, Automobile Board of Trade.
 Jan. 20-25.....Philadelphia, Pa., Annual Automobile Show.
 Jan. 27-Feb. 1.....Detroit, Mich., Annual Automobile Show.
 Feb. 1-8.....Chicago, Ill., Annual Automobile Show.
 Feb. 10-15.....Minneapolis, Minn., Annual Automobile Show.
 Feb. 17-22.....Kansas City, Kan., Annual Automobile Show.
 Feb. 24-March 1....St. Louis, Mo., Annual Automobile Show.
 March 3-8.....Pittsburgh, Pa., Annual Automobile Show.
 March 8-15.....Boston, Mass., Annual Automobile Show.
 March 17-22.....Buffalo, N. Y., Annual Automobile Show.
 March 19-23.....Boston, Mass., Annual Truck Show.

March 24-29.....Indianapolis, Ind., Annual Automobile Show.

Race Meets, Runs, Hill Climbs, Etc.

Aug. 30-31.....Elgin, Ill., Road Races, Chicago Automobile Club and Elgin Automobile Road Racing Association.
 Sept. 1-2.....St. Louis, Mo., Track Races, Universal Exposition Company.
 Sept. 2.....Indianapolis, Ind., Speedway Meet.
 Sept. 2.....Winnipeg, Man., Track Meet.
 Sept. 3-6.....Chicago, Ill., Commercial Vehicle Reliability Run, Chicago Motor Club.
 Sept. 11-14.....Buffalo, N. Y., Third Annual Reliability Tour, Automobile Club of Buffalo.
 Sept. 17.....Milwaukee, Wis., Grand Prize Race.
 Sept. 20.....Milwaukee, Wis., Wisconsin Challenge and Pabst Trophy Races.
 Sept. 21.....Milwaukee, Wis., Vanderbilt Cup Race.
 Sept. 21.....Washington, D. C., Reliability Run, Automobile Club of Washington.
 Oct. 7-11.....Chicago, Ill., Reliability Run, Chicago Motor Club.
 Oct. 12.....Salem, N. H., Track Meet, Rockingham Park.
 Nov. 6.....Shreveport, La., Track Meet, Shreveport Automobile Club.

CHARACTERISTICS OF TRUCKS COMPETING IN FRENCH ARMY TRIALS TO QUALIFY FOR SUBSIDIES

Make	Ap-prox. Load	Motor	Revolu-tions	Indic. H. P.	Cooling	Car-bur-ator	Igni-tion	Oiling	Clutch	Gears	Drive	Wheels	Tires	Weights in Pounds				Position of Motor	
														Front	Rear	Empty	Total		
Schneider.....	3	3.9x4.7	1,000	22	Ther.	Solex.	Eise...	Circ...	Cone...	3	Sh'ft.	Wood...			3,747	9,589	6,701	13,359	Un. bon.
Panhard-Levassor.....	3	3.5x5.1	1,350	15	Pump	Krebs.	Bosch.	Circ...	Discs...	4	Ch'ns.	Wood...	Rub...		5,048	8,708	6,944	13,668	Un. seat
Delahaye.....	3	3.5x5.5	1,000	20-24	Pump	Dela...	Bosch.	Press...	Cone...	4	Ch'ns.	Wood...	R&S...		5,423	9,148	7,208	14,440	Un. seat
La Buire.....	2	3.5x6.2	1,000	30	Pump	Zen...	Bosch.	Press...	Discs...	4	Sh'ft.	Wood...	Rub...		3,703	9,391	7,341	13,227	Un. bon.
Vinot-Deguingand.....	2	3.7x5.1	1,000	20	Pump	Solex.	Bosch.	Press...	Cone...	4	Ch'ns.	Wood...	Rub...		3,416	9,259	7,120	12,632	Un. bon.
Aries.....	2	3.3x5.1	1,200	14-18	Pump	G&A.	Bosch.	Press...	Discs...	3	Chains	Wood...	Rub...		3,438	8,686	6,591	12,081	Un. seat
Delaugere-Clayette.....	2	3.9x5.5	1,300	18	Ther.	Solex.	Bosch.	Circ...	Cone...	4	Ch'ns.	Wood...	Rub...		2,821	9,722	6,679	12,654	Un. bon.
Delaugere-Clayette.....	3	3.9x5.5	1,300	18	Ther.	Solex.	Bosch.	Circ...	Cone...	4	Ch'ns.	Wood...	Rub...		5,842	9,369	7,429	15,564	Un. seat
Clement-Bayard.....	2	3.1x5.5	1,200	15	Ther.	Clem...	Bosch.	Circ...	Cone...	4	Ch'ns.	Steel...	Rub...		5,136	7,605	7,120	12,786	Un. seat
Clement-Bayard.....	3	3.9x5.5	1,200	20	Ther.	Clem...	Bosch.	Circ...	Cone...	4	Ch'ns.	Steel...	Rub...		5,930	9,501	7,517	15,409	Un. seat
Clement-Bayard.....	5	3.9x5.5	1,200	20	Ther.	Clem...	Bosch.	Circ...	Cone...	4	Ch'ns.	Steel...	Rub...		6,569	11,000	8,906	17,570	Un. seat
(Tractor)															6,503	9,810	5,555	16,314	
Latil front drive....	2	3.3x5.5	1,000	16	Ther.	Solex.	Bosch.	Trou...	Cone...	4	Sh'ft.	Wood...	R&S...		4,982	6,834	6,944	11,816	Un. bon.
Saurer.....	2	4.3x5.5	1,000	30	Pump	G&A.	Eise...	Press...	Cone...	4	Sh'ft.	Wood...	Rub...		3,174	8,465	6,238	11,574	Un. bon.
Saurer.....	3	4.3x5.5	1,000	30	Pump	G&A.	Eise...	Press...	Cone...	4	Ch'ns.	Wood...	Rub...		3,703	9,876	7,032	13,668	Un. bon.
De Dion.....	2	3.1x5.5	1,000	14	Ther.	Zen...	Nilme.	Press...	Plate...	3	Sh'ft.	Wood...	Rub...		2,777	9,104	6,635	12,015	Un. bon.
De Dion.....	2	3.1x5.5	1,000	14	Ther.	Zen...	Nilme.	Press...	Plate...	3	Sh'ft.	Wood...	Rub...		4,100	8,598	7,109	12,863	Un. seat
Berliet.....	2	3.9x5.5	1,200	22	Ther.	Berl...	Bosch.	Circ...	Discs...	4	Ch'ns.	Wood...	Rub...		3,394	9,788	7,252	13,425	Un. bon.
Berliet.....	3	3.9x5.5	1,200	22	Ther.	Berl...	Bosch.	Circ...	Discs...	4	Ch'ns.	Wood...	Rub...		4,805	9,854	7,252	14,925	Un. seat
Berliet.....	3	3.9x5.5	1,200	22	Ther.	Berl...	Bosch.	Circ...	Discs...	4	Ch'ns.	Wood...	R&S...		9,942	7,297	15,013	Un. seat	
Peugeot with trailer.	5	4.3x5.1	1,150	35	Pump	Clau...	Bosch.	Press...	Discs...	4	Ch'ns.	S. Tubes	R&S...		6,944	10,582	9,259	17,570	Un. seat
Motobloc.....	2	3.5x5.1	1,200	16	Pump	Clau...	Bosch.	Press...	Discs...	4	Ch'ns.	Wood...	Rub...		9,964	3,990	15,520		
Cohendet.....	3	3.9x6.6	1,000	35	Ther.	Clau...	Bosch.	Press...	Cone...	4	Ch'ns.	Wood...	Rub...		5,026	8,642	7,010	12,125	Un. bon.
Renault.....	2	3.5x5.5	1,100	14	Ther.	Ren...	Bosch.	Circ...	Cone...	4	Sh'ft.	Wood...	Rub...		9,611	7,451	15,079	Un. seat	
Renault.....	3	3.5x5.5	1,100	14	Ther.	Ren...	Bosch.	Circ...	Cone...	4	Sh'ft.	Wood...	Rub...		3,152	8,664	6,547	12,103	Un. bon.



Scene in Minneapolis just before the start of the annual tour of the Minnesota State Automobile Association for Winnipeg

Seven Clean in Winnipeg

Annual Tour of Minnesota State Automobile Association Meets with Rain and Bad Roads

Running Schedule Twice Lowered—Tour Expected to Result in Big Business

WINNIPEG, MAN., Aug. 11—Minnesotans in their fourth annual reliability tour, after three days of road experience have found that northern Minnesota soil and that of Manitoba may be right to raise grain, but that it is not designed for touring after a rain. The running schedule has twice been cut 2 miles an hour all around.

The start was made Thursday morning from the Automobile Club of Minneapolis with nine contesting cars and two non-competing. One of the former, the Staver-Chicago, withdrew at Hallock Saturday afternoon, due to trouble with the steering gear and other slight difficulties, but expects to pick up the trail at the American border tomorrow. The McFarlan and Cutting entries failed to check out. The Packard non-competing car is at Hallock with gear stripped and differential housing wrecked. The Stoddard-Knight pacemaker car, after a series of slight accidents to tires and fenders, cracked its crankcase over a railroad track 3 miles east of Red Lake Falls. The hole was patched and the pacemaker resumed the lead the following day.

Road work galore was encountered the first day and the run therefore was slow. Tire trouble was the main hazard for the second day which ended for the night at Thief River Falls. The noon control was made at the home of a half-breed Indian family where luncheon was served by descendants of the Ojibways.

On the third day the gumbo had dried and left ruts deep and hard, and the mire was so deep at points that it engaged the radius rods on the front of the runabout class cars, and even touched the hubs of the touring machines. The result was slow running and a necessity for detouring along the right of way of the Great Northern road.

When the border line was reached, the Canadians' custom officials were induced to allow the foreigners to enter at slight cost.

The trip is expected to be a great sales tour for the medium and low-priced car dealer and manufacturer. Following is the list of entries, with the first day penalties:

CLASS E, GRADE III				
No.	Car	Driver	Division	Penalty
1	Marmon	Bohn Fawkes	5	0
2	Hupmobile	Warren Munzer	2	0
3	Studebaker 20	William Soules	1	9
5	Cadillac	A. Zekman	3	0
7	Mitchell	George Murphy	4	—
8	Paige-Detroit	Ed. Fox	2	9
9	Warren-Detroit	Harry Rockelman	2	0
10	Staver	Noah Moss	5	withdrawn
11	Reo V	N. Bass		0
NON-CONTESTANTS, GRADE IV				
12	Buick	H. G. Blanchard	2	0
13	Packard	Charles Smith	7	0

Chicagoans Stopped by Rain

CHICAGO, Aug. 12—Torrents of rain, coupled with reports of wretched road conditions, caused the abandonment of the second annual team match between the amateurs and tradesmen of the Chicago Motor Club after half of it had been run. Nine amateurs and ten tradesmen started in the match which left Chicago last Thursday morning for St. Joseph, Mich. The run over, 118 miles, was made easily, the weather being good, but the roads in Michigan sandy. At the end of the first half of the match the amateurs had only 3 points against their team, while the tradesmen were loaded down with 170, the bulk of them coming because one of the cars came in after the 2-hour limit, the delay being caused by tire trouble.

Making Plans for Elgin

Entry List Growing Daily, and Fields for The Five Events on the Card Will Be Well Filled

Tetzlaff's Fiat in Elgin Trophy and Free-for-All Races—Mercedes Also Entered

CHICAGO, Aug. 12—Prospects for the annual Elgin road races are bright indeed. The entry list continues to grow daily and it looks now as if the field would be made up of a fast lot of cars, including several of foreign make.

Teddy Tetzlaff, holder of the world's road record, reached Chicago Saturday and signed blanks which book him for competition in both the Elgin trophy and the free-for-all on the second day of the meet. He is to drive the smaller Fiat which he handled at Indianapolis. Tetzlaff states that E. E. Hewlett, his backer, will send on the grand prix Fiat for the free-for-all, which will be driven by Dave Lewis, another California star.

A Mercedes also has been dropped into the speed battle, the entry of George Clark having been secured at Galveston by representatives of the Chicago Automobile Club. Clark intends following Tetzlaff's example and will run in both races on the second day.

One entry has been booked for the race for cars 230 inches and under, which was added to the card last week, the nomination coming from F. S. Duesenberg, who has declared the little Mason which did so well in the last Algonquin hill-climb. Bill Endicott is to drive the car.

Heavy rains the past few days have delayed the work on the course, but it is expected that within a day or so half a dozen gangs of men will get busy making the repairs which are needed. The military has been secured and now there seems to be no stumbling block in the way of the promoters.

Atlanta, Ga., Aug. 7—The idea, novel in the South at least, of a 1-day tour within the confines of a single county was given a work-out here today when the 1-Day-Route Around Fulton County, Ga., was dedicated.

Of the thirty-two cars entered twenty-five started and sixteen finished. That no more finished is due to the fact that in the 125-mile route there were virtually 10 miles of clay road.

Electric Pathfinder Fighting Mud

LORETTA, TENN., Aug. 11—After three days of excessively heavy rain in this section the official pathfinder of the American Automobile Association tour of 1912, a Flanders electric, reached this place over roads that are deep in mud and almost tractionless. The route being picked out will be known as the Jackson Highway and in one of the counties traversed today \$200,000 will be expended in improvements before the tour itself passes.

The pathfinder has covered the route from Louisville to Loretta during the past week, touching at Mammoth Cave, Nashville, Bristol and Columbia, bringing the total distance to 799 miles.

It was found that the Bristol road was impracticable because of the numerous ferriages necessary and the lack of facilities for such transport.

Tomorrow's course is toward Memphis, but cutting across the northern end of Alabama and Mississippi, touching Sheffield, Florence and Corinth before swinging north to Memphis.

Transcontinental Alco's Progress

PPOINT OF ROCKS, Wyo., Aug. 10—The trip of the Transcontinental Alco truck is just one flood after another, according to advices received here from the crew.

Just as the motor freighter, which is now engaged in the first delivery of merchandise from one end of the country to the other, was going well after experiencing ten cloudbursts in 8 days, it ran into another heavy rainstorm that hung it up along with four transcontinental touring parties and two prairie schooner outfits.

Reports from the Wyoming country are to the effect that floods are worse at this time than in 14 years and travel by motor through certain sections has been made impossible by the conditions of the road. Trails are both impassable and invisible.

From latest information the Alco truck is on its way towards Evanston, Wyo., where it is taking a trail towards Salt Lake City; from there the route will lead to Reno, San Francisco and Petaluma, Cal., where the load of merchandise will be delivered.



Flanders electric A. A. A. pathfinder crossing to Columbus, Ind.



Trail of Transcontinental Alco truck after a heavy rain



Vol. XXVII

Thursday, August 15, 1912

No. 7

THE CLASS JOURNAL COMPANY

H. M. Swetland, President

C. R. McMillen, Vice-President

W. I. Ralph, Secretary E. M. Corey, Treasurer
231-241 West 39th Street, New York City**BRANCH OFFICES**Chicago—910 South Michigan Avenue
Boston—1035 Old South BuildingDetroit—1501 Ford Building
Cleveland—309 Park Building**EDITORIAL**

David Beecroft, Directing Editor

James R. Doolittle
Hans Weisz
L. V. Spencer**BUSINESS**

Francis L. Wurzburg, General Manager

ADVERTISING

W. I. Ralph, Manager

C. H. Gurnett, Chicago
F. J. Robinson, Chicago
C. K. Brauns, DetroitCable Address ————— Autoland, New York
Long Distance Telephone ————— 2046 Bryant, New York**SUBSCRIPTION RATES**United States and Mexico ————— One Year, \$3.00
Other Countries in Postal Union, including Canada ————— One Year, 5.00
To Subscribers—Do not send money by ordinary mail. Remit by Draft,
Post-Office or Express Money Order, or Register your letter.

Entered at New York, N. Y., as second-class matter.

The Automobile is a consolidation of The Automobile (monthly) and the Motor Review (weekly), May, 1902, Dealer and Repairman (monthly), October, 1903 and the Automobile Magazine (monthly), July, 1907.

Developing Export Trade

Major Points of Consideration

THE export trade offers a fruitful field to the American automobile maker owing to the widespread use of the motor vehicle in such continents as South America, Africa and Australia and parts of Asia. In every one of these territories the European maker obtained a leading advantage due to his being several years earlier in the manufacturing field than our big organizations and to the fact that when their home field was apparently surfeited, American makers were having the utmost difficulty in filling orders and meeting urgent demands. With such a condition of market saturation in Europe and so healthy a demand here, there was little hope for other conditions than those which happened: namely, that European makers should start rigorously the development of the foreign field and that American makers should give every attention to satisfying the home demand. In this way Europe gained a position of precedence in the foreign field, a position she has constantly strengthened ever since and a position which the American builder has been valiantly attacking during the last 2 years.

The European maker has been longer schooled in the export trade than many of our builders and consequently

while his work may have been slower it has also been surer and on a more permanent basis. Not a few of our concerns which have shown particular aggression have laid themselves open to criticism by their entire disregard for local conditions in the countries to which they have exported their cars and also by some of the tactics pursued. When doing business in a foreign clime it is essential to meet the citizen of that land in his own business way. If he has his characteristic way of opening trade negotiations, they may appear antiquated; the aggressive American export man may consider them quite at variance with home methods, but they are his ways of doing business. This is imperative until a business friendship extending over some years has been made, by which time the foreigner will have learned to rely on the export man, will have learned to depend on his goods, will have become acquainted with his various business methods, and in a word, will have become thoroughly satisfied that his ways are just, his intentions always to do right and his commodities dependable.

Some of the American builders have shown excellent judgment in developing their export trade. They have not set out with a large consignment of cars, some of questionable vintage, with larger advertising appropriations and masses of literature; rather their course has been one of conservatism. They have opened up headquarters, perhaps 2, 3 or even 4 years before they made any effort to carry cars on hand for sale and immediate delivery. They carried stocks of spare parts for all who might be touring in those countries. They sold machines on photographs, blue prints and performances. The citizens of the country were impressed with the fact that these concerns were to be trusted, that they had confidence in their goods and that they could be expected to stand firmly back of their product, irrespective of the quarter of the globe in which it might be sold.

Other American houses took equally judicious courses. They established assembly factories, made real estate investments and stocked well up with repair parts when starting to do business. The result was only as could be expected: The business grew and flourished, because the method of attack engendered confidence in the people. The people recognized that they were not purchasing from some concern that would be here to-day and gone to-morrow. They realized that if their car remained in commission for 10 years or longer there was good opportunity that the supply of spare parts and the factor of attention that the consumer would receive would be as great as at the present time.

Contrast with these methods those of the concern that engages the so-called export expert who hopes to stampede the people into his product. His advertising appropriations are enormous compared with the value of the commodity he has to sell. His supply of spare parts is amazingly small, his cars in some cases are carried-over models, and his prices have been raised as high as 100 per cent. over the American price. He hopes to storm the citadel, to make conquests in a day or a week and to establish a broad export trade in 3 or 6 months at the outside. The result is that at the end of that period he returns, some of his cars sold, the remainder left with some not-too-dependable organization, the advertising appropriation exhausted, the home company dissatisfied and the export trade manacled at the start.

Big Crops Are Assured

Reports as of August 1 Indicate Enormous Harvests of the Cereals Throughout the Country.

WASHINGTON, D. C., Aug. 12—Bumper crops are assured, according to the August crop report of the United States government, and in all probability the actual harvest will be larger than those indicated by the official figures. The estimates are dated August 1 and in the days that have intervened since then, favorable progress has been made in all lines of agriculture. Perfect crop weather has been experienced and much improvement must have occurred since the first of the month.

The government figures show that the yield of winter wheat has been an average of 15.1 bushels to the acre and while the acreage is smaller than last year by 5,623,000, the average yield is .6 bushel larger per acre, bringing the official estimate of the yield to 390,000,000 bushels. This is 64,000,000 bushels smaller than last year in the departmental estimate. That the estimate for 1911 is too high and that of 1912 too low is generally admitted. The official figures of last year have been revised to conform with the data secured by the census bureau which reduces the acreage to 29,162,000 and the yield to 430,000,000. A report received from the Kansas Bureau of Agriculture shows that in that state alone the official figures for this year as to winter wheat acreage are 600,000 acres too low. This would account for a difference of 11,000,000 bushels of wheat in Kansas. Thus, according to close students of the situation, the weight of probability points to a yield of winter wheat not far from 400,000,000 bushels, with the chances favoring a larger yield rather than a smaller.

The condition of spring wheat is placed at 90.4, a gain of 1.1 since July 1. Since August 1 the condition has improved materially. Last year the yield of spring wheat was 190,000,000 bushels. The August 1 report indicates a yield of 290,000,000 bushels and the favorable weather during the early part of this month when spring wheat is in the final stage of ripening makes it certain that the total yield will be larger.

The corn crop is estimated at 2,811,000,000 bushels, a decrease in condition of 1.5 points since July 1. Oklahoma makes the poorest showing in corn this season with a condition of 65, against a 10-year average of 76. Iowa, a huge producer, has a condition estimated at 89, against a 10-year average of 83. Oats crop is in splendid condition all over the country.

Summarized, the grain crops of the country are estimated by the government to be about as follows:

Grain	Acreage	Estimated yield	Condition
Winter wheat	25,744,000	390,000,000	...
Spring wheat	19,201,000	290,000,000	90.4
Corn	108,110,000	2,811,000,000	80.
Oats	37,844,000	1,207,000,000	90.3
Other crops, except cotton	17,900,000	675,000,000	...
		Tons	
Hay	49,209,000	73,000,000	...
Totals compared with last year:			
Grain and crops	1912	1911	
Hay, tons	5,373,000,000	4,616,000,000	
	73,000,000	47,000,000	

The difference in money value is in the neighborhood of \$1,200,000,000 in favor of the current season.

Made His Own License Plates

LOCKPORT, N. Y., Aug. 12—Albert Dussault, of the Dussault Garage, of this city, will be given a hearing on Friday in Police Court on charge of faking New York state license numbers on the plates of his automobiles. It is claimed that Dussault painted over last year's plates with numbers he secured from the state's automobile bureau at Buffalo, and that the prisoner has several similar sets of numbers in use throughout the city.

Boston Booms Electrics

Business Men of the Hub to be Convinced of Utility of Commercial Vehicles of that Type

BOSTON, MASS., Aug. 10—An independent trucking system using electric vehicles exclusively and competing with the horse-drawn vehicles now in use by the majority of the trucking firms of Boston is the latest recommendation from the special committee of the Electric Vehicle Club of Boston appointed to look after business problems. The principal object of the contemplated move is the education of the business men in the growth, durability and economical operation of the electric vehicle, although it is believed that the company will be self-supporting and will later on be purchased by private individuals or a corporation when its success has been fully demonstrated. The avowed intention of the committee is to compete actively with teamsters with a view to increasing local sales of electric vehicles among this class of prospective customers as well as among the large corporations doing their own transportation.

In detail, the project that has been laid before the club by a special committee appointed to devise ways and means for promoting the sale of electric commercial cars in Boston, calls for the organization of a \$100,000 company under the auspices of the commercial section of the club. Not less than one-half of the stock is to be subscribed or raised by truck, tire, battery and other interested concerns, subscriptions to be payable either in cash or in suitable equipment.

W. E. Eldridge, representing the Couple-Gear Company, is chairman of the committee which formulated the plan. The other members are: J. Walter Emery, Walker Vehicle Company; B. A. Tirrell, Commercial Truck Company; N. Rommelfenger, Detroit Electric Car Company; R. F. Ketchum, General Motors Truck Company; J. W. Bowman, Waverley Company; H. E. Taylor, Lansden Electric Company; Frank N. Phelps, Baker Motor Vehicle Company.

"It is estimated that two-thirds of the horses operating in and around Boston are owned by professional teaming contractors and expressmen," reported the committee in presenting its plan. "The reason for this is that the service required in the transportation departments of many of the merchants and manufacturers having hauling to do is intermittent. They need several trucks today—and perhaps only one tomorrow. More service must be had during busy seasons than dull."

"It therefore would seem that the coming of the electric truck is likely to make much change in the percentage of the total hauling now done by the professional contractors."

"The merchants or manufacturers who will buy the electric trucks and wagons will be only those who have steady work for them. The bulk of the work in Boston will continue to be done by vehicles kept for hire. When the complete change from horses to motor vehicles has been made, the majority of the equipment is likely to be owned by those of the now existing teamsters whose foresight and finances admit of the adoption of the new ways, or more likely by large motor trucking service corporations financed from entirely new sources. If these are the conditions—how shall we confront them?"

Goggles Duty, 1 3-8 Cents per Pound

WASHINGTON, D. C., Aug. 12—The board of general appraisers recently rendered a decision wherein it was held that certain so-called motor goggles, which were assessed with duty at 10 cents per dozen pairs and 45 per cent. ad valorem, under paragraph 106 of the tariff act, were properly dutiable at 1 3-8 cents per pound and 5 per cent. ad valorem under paragraphs 90 and 104 of said act.



News of the Week Condensed



Showing sixty Federal trucks in line in the recent Cadillac parade in Detroit, led by a shining, white delivery wagon

MANY Federal Trucks in Line—In the recent Cadillac parade in Detroit there were many commercial vehicles to swell the number of automobiles to 5,000 as well as pleasure cars. The Federal contingent numbered sixty trucks of many styles, ranging from the heaviest type of truck made by the concern to its lightest delivery model.

After the Cut-Outs—The City Council of Coshocton, O., has adopted an ordinance against the use of the muffler cut-out.

Oakland Branch in Cleveland—In furtherance of the new sales policy of the Oakland Motor Company, a factory branch has been opened in Cleveland, O., where this car will be handled exclusively.

Tyler Goes to Marion—C. H. Tyler, former manager of the United Motor Cleveland Company, Cleveland, O., signed to become special representative of the Marion Motor Car Company in the Central West.

Lloyd to Leave Velie—George H. Lloyd, who has been sales manager at the factory of the Velie Motor Vehicle Company since 1908, has announced his retirement. He has not yet made any plans for the future.

Griffith Joins Ohio Electric—Warren E. Griffith has accepted a position as assistant sales manager for the Ohio Electric Car Company, Toledo, O. Owing to the increased business of this concern it was found necessary to branch out in its sales department.

Undertaker Makes Innovation—With the purchase of a Peerless hearse, ten Reo limousines, a Peerless casket wagon and an embalmer's runabout a New Orleans, La., undertaking establishment has gone on a motor basis. One of the peculiar local customs in New Orleans is the pomp observed at funerals.

Auto License Plates Expensive—The automobile license plates for 1913 will cost New York state \$27,150, or at the rate of 30 cents a pair, which will make the amount \$30,000 if the registration figures reach 100,000, as expected. The plates are to be finished in baked enamel. The contract was awarded to the Manhattan Supply Company, of New York.

Absorbs Transfer Company—As a result of a deal consummated the past week the Seattle, Wash., Taxicab Company has absorbed the baggage and passenger business of the Seattle Transfer Company. The name of the Seattle Taxicab Company has been changed to the Seattle Taxicab & Transfer Company. A motor service will be installed in all departments of the new business.

Willys Heavily Insured—President John N. Willys, of the Willys-Overland Automobile Company is the most heavily insured man in Toledo, O. He carries \$500,000 for which his wife is beneficiary; \$500,000 to be paid at his death to his child; \$500,000 in favor of the Willys-Overland company, and \$300,000 which he carried before taking out the three other policies. Mr. Willys carries in all \$1,800,000 insurance on his life.

Motz Branch in Pittsburgh—A factory branch of the Motz Tire & Rubber Company, of Akron, O., has been opened in Pittsburgh, Pa. The new branch has been made necessary by a large increase in the use of the Motz double-notch tread cushion tire in this district. It is equipped to give a complete service to the users of these tires, and is now operating with a full corps of workmen and tire experts. S. H. Fronsdorf is in charge.

Canada Exporting Cars—When the Rakala of the New Zealand Shipping Company sails for Auckland and other Antipodean ports this week she will carry among other items of general cargo 180 Canadian automobiles, worth approximately \$250,000. The Whakatane sailed from Montreal 6 weeks ago with 280 automobiles on board, while one of the Elder Dempster liners, the Ninina, leaving Montreal a month ago carried 100 or more cars to South Africa.

Dr. McClure in Charge—Merging the United States Motor Company's interests places Dr. F. E. McClure in charge of the marketing of all of the company's products in the Cleveland, O., district. He retains the management of the States Cleveland Motor Company, which handles the Stoddard-Dayton, Brush and Currier cars, and, in addition, will have charge of the marketing of Columbia and Maxwell, which the United Motor Cleveland Company markets.

New Agencies Established During the Week

PLEASURE CARS

Place	Car	Agent
Albany, N. Y.	Peerless	Albany Garage Co.
Albany, N. Y.	White	Albany Garage Co.
Andalusia, Ala.	R-C-H	Fletcher & O'Neal
Austin, Minn.	R-C-H	A. W. Wolten
Babylon, N. Y.	R-C-H	G. Haab
Baltimore, Md.	Stoddard-Dayton	H. S. Block
Beloit, Wis.	Columbia	Manhall Garage
Beloit, Wis.	Hudson	Manhall Garage
Beloit, Wis.	Reo	Manhall Garage
Benton, Pa.	R-C-H	J. F. Wright
Buxton, Ia.	Nyberg	Jack Williams
Chicago, Ill.	R-C-H	G. A. Jacobs
Cleveland, Tenn.	R-C-H	J. B. Hargis
Cleveland, O.	R-C-H	Guia A. Baumetz
Columbia, S. C.	R-C-H	Independent Auto Sales Co.
Columbus, O.	Inter-State	R. Westwater
Columbus, O.	Mercer	Sitgreaves Automobile Livery
Columbus, O.	R-C-H	Sitgreaves & Boyd
Danville, Ill.	R-C-H	J. P. Agan
Denver, Col.	R-C-H	W. Thorne Auto Co.
Dixon, Ia.	R-C-H	Hansen Auto Co.
Dodge Center, Minn.	R-C-H	G. F. Wolter
Dothan, Ala.	R-C-H	Dothan Carriage Co.
Edison, Ga.	Oakland	C. C. Weaver
Elkhart, Ind.	R-C-H	A. C. Adams
Faribault, Minn.	R-C-H	Mutual Auto Co.
Gagetown, Mich.	R-C-H	Gagetown Auto Co.
Geneva, N. Y.	R-C-H	D. M. Dorman
Greeley, Co.	R-C-H	G. S. Hammett
Greensboro, N. C.	R-C-H	P. W. Richardson
Honey Grove, Tex.	R-C-H	J. I. Warren
Huron, S. D.	R-C-H	E. I. Bowe
Indianapolis, Ind.	American	A. & M. Sales & Service Co.
Indianapolis, Ind.	Chalmers	Conduit Auto Co.
Indianapolis, Ind.	Marion	A. & M. Sales & Service Co.
Jacksonville, Fla.	Nyberg	L. F. Carr
Kaukauna, Wis.	Marathon	Kaukauna Auto Co.
Knoxville, Tenn.	R-C-H	Vest & Anderson Co.
Lakefield, Minn.	R-C-H	Finch & Stinar
Little Valley, N. Y.	R-C-H	H. W. Burrell & D. J. Case
Louisville, Ky.	Overland	Allen E. Reid
Luthersville, Ga.	R-C-H	A. O. Williams
Machias, Me.	R-C-H	Crane Brothers
Madison, Wis.	Hudson	Ritter Auto Co.
Milton, N. D.	R-C-H	Ralph Prom
Minneapolis, Minn.	Hudson	Smith & Heberle
Minneapolis, Minn.	Mercer	Mercer Sales Co.
Moody, Tex.	R-C-H	Clay & Gilmore
Mount Pleasant, Tex.	R-C-H	R. H. Love
Newark, N. Y.	R-C-H	Farnsworth & Welcher
New Haven, Conn.	R-C-H	Cowles Toleman

PLEASURE CARS

Place	Car	Agent
New London, Conn.	R-C-H	Myers & Lippincott
Nonticelle, Ind.	R-C-H	Clifford Auto Co.
Norristown, Pa.	R-C-H	D. H. White
Norwich, Conn.	R-C-H	Uncas Garage
Oswego, N. Y.	R-C-H	Rowe & Sikes
Ottawa, Can.	Maxwell	International M. Co.
Ottawa, Can.	R-C-H	J. Nelson & Son
Pensacola, Fla.	R-C-H	W. L. Wittich & Co.
Peru, Ill.	R-C-H	A. A. Bakewell
Pine Bluff, Ark.	Mercer	Pine Bluff Motor Car Co.
Portland, Maine	R-C-H	F. D. Morse
Poughkeepsie, N. Y.	R-C-H	E. B. Delamater
Quincy, Mass.	R-C-H	Central Garage
Quincy, Ill.	R-C-H	Reid Motor Co.
Redfield, S. D.	R-C-H	Blaine Auto Co.
Rochester, N. Y.	Hudson	Baird Motor Co.
Rochester, N. Y.	Locomobile	Empire State G. V. Co.
Roswell, Ga.	R-C-H	Walton & Ellington
Salem, O.	R-C-H	Salem Auto & Repair Co.
San Luis Obispo, Cal.	R-C-H	R. A. Minor
Saranac Lake, N. Y.	R-C-H	J. J. Duquette & Moody
Shamokin, Pa.	Abbott-Detroit	Warren Unger
Shamokin, Pa.	National	Warren Unger
Shamokin, Pa.	Reo	Warren Unger
South Bend, Ind.	R-C-H	Otis Motor Car Co.
Steubenville, O.	NYberg	Hunter & Co.
Thomasville, Ga.	Oakland	Thomasville Motor Co.
Topeka, Kan.	R-C-H	J. C. Vanier
Traverse City, Mich.	R-C-H	Hines Motor Co.
Tuckahoe, N. J.	R-C-H	A. B. Adams
Uhrichsville, O.	R-C-H	J. W. Lytle
Vancouver, B. C.	Mercer	Terminal City Motor Co.
Wapakoneta, O.	Mercer	C. J. McFarland
Ware, Mass.	R-C-H	Hoyt Brothers
Waycross, Ga.	R-C-H	H. L. Marvil
Wilmont, Minn.	R-C-H	Olund & Nystrom
Windom, Minn.	R-C-H	W. P. Cowan
Witt, Va.	R-C-H	G. H. Guerrant
Wionona, Minn.	R-C-H	E. J. Tisdale
Yates Center, Kan.	R-C-H	Patterson & Patterson
Youngstown, O.	Mercer	R. L. Culbertson & Co.

COMMERCIAL VEHICLES

Binghamton, N. Y.	Alco	M. T. Rogers
Boston, Mass.	Brown	R. H. & R. L. Smith Co.
Harrisburg, Pa.	Autocar	A. Redmond
Minneapolis, Minn.	Commerce	Hume & Ragen
Minneapolis, Minn.	Universal	Hume & Ragen
Peekskill, N. Y.	Alco	W. H. Ash
Holyoke, Mass.	Adams	Magna Auto Co.
Winsted, Conn.	Adams	Roscoe Benjamin

Gibbes President Columbus Club—Frank H. Gibbes has been elected president of the Columbus Automobile Club to succeed F. S. Terry, who resigned. Dr. E. C. L. Adams was chosen vice-president of the club.

Vancouver's Big Fire Loss—Between fifty and sixty cars were destroyed in a recent fire in Vancouver, B. C., it is estimated by the A. B. C. Motor Company, whose loss amounted to \$225,000. The total loss amounted to about \$2,000,000.

Kelly Experimenting with New Truck—The Kelly Motor Truck Company, of Springfield, O., builders of 3-ton motor trucks, have been experimenting with a 5-ton truck of their own make, which it is thought will be added to their list of models for 1913.

Displacing the Army Mule—Recently seven White motor vehicles ranging in capacity from 1,500 pounds to 5 tons left New York City to be used by the Red and Blue armies now maneuvering for possession of the city. The trucks are to be utilized in carrying the luggage of the men, besides the tents and camp supplies.

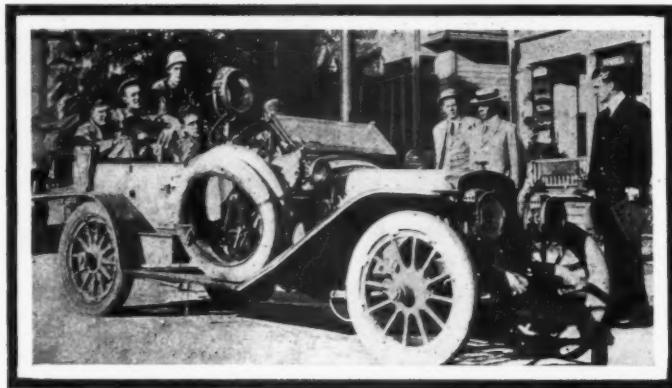
Russia Field for American Cars—The field for American-made automobiles in Russia is commented upon at considerable length by Vice-Consul Frederick W. W. Cauldwell, at Batum, to the State Department, who points out that a good market for lightweight, low-priced American machines should be found in the Caucasus. The American car is peculiarly suited to road conditions there, he points out, as the roads are practically the same as those found in America.

Mobile Drawing Tourists—Mobile, Ala., is making every effort to attract the automobile tourists of its whole section. The greatest interest is in a first-class highway to New Orleans. Other plans include a model road to Jackson, the

capital city of Mississippi, a road leading to Selma and intermediate Alabama points, and still another will follow the coast to Pensacola, Fla. The road to Selma will be a link in the proposed highway from Tennessee to the Gulf, which has been promised federal support.



One of the fleet of White trucks engaged in army maneuvers around New York City



How five Western college men are going to Princeton

New Remy Service Station—The Remy Electric Company, Anderson, Ind., has opened a service station at the Frey Auto Supply Company, Buffalo, N. Y.

Meeley Has Philadelphia Office—In addition to his shop at No. 1331 Mount Vernon street, Philadelphia, Pa., George Meeley has established a sales office at No. 702 North Broad street.

Hughes Now Superintendent—Oswald V. Hughes has become superintendent of the gasoline pleasure vehicle department of the Empire State General Vehicle Company, Rochester, N. Y.

Opens Detroit Branch—The E. R. Van Wagener Company, Syracuse, N. Y., maker of castings and die-cast bearings, has opened a sales office in Detroit, Mich., with H. J. McCallam, Jr., in charge.

To Handle Staggard—The Licking Motor Car Company, Newark, O., has closed a contract with the Republic Tire & Rubber Company, Columbus, O., to handle the Staggard tread tire in the Newark territory.

Cross Continent to College—Woodward W. Duke and four other young men are on their way across the continent in a six-cylinder Lozier automobile. They are making the trip from Los Angeles to Princeton.

Smith Slowly Recovering—Frank E. Smith, manager of the New Castle, Ind., plant of the United States Motor Company, is slowly recovering from the serious illness sustained in an automobile accident on May 23 last.

Hartford Suspension Branch—D. E. Harvey, New England manager for the Hartford Suspension Company, has opened a branch at Bretton Woods, N. H., for the sale of the various accessories made by that company.

Campbell-Ewald Branches Out—A branch office of the Campbell-Ewald advertising service of Detroit, Mich., is to be opened in Saginaw. The members of the firm are F. J. Campbell and H. T. Ewald, both of whom have been long connected in Detroit advertising circles.

East with Amplex—George L. East has resigned as director of advertising of the Olds Motor Works to be affiliated in a similar capacity with the Amplex Motor Car Company, Mishawaka, Ind. He will conduct the sales and advertising departments at his Chicago offices.

To Handle Wholesale End—The W. L. Russell Company, handler of the Regal in Boston, Mass., doing a retail business, has decided to take on the wholesale end also. The retail business will be conducted in the Park square sales-rooms with the Haynes and Veerac truck, while the wholesale business will be conducted from the Motor Mart.

Starter Company Active—The Ignition Starter Company has opened a branch in Indianapolis, Ind., with H. L. Morgan in charge as manager. The company has closed a deal for a plant in Detroit, Mich., which will give them a floor-

space of 100,000 square feet for the manufacture of their new electric starting device. It has also contracted with the Buick company for 25,000 starters of the acetylene type for the 1913 Buick cars.

Need Paved Roadway—Carl G. Fisher and James A. Allison, owners of the Prest-O-Lite Company, Indianapolis, Ind., and promoters of Speedway, the horseless city, have called on city officials demanding that they keep a promise made some months ago that a paved roadway would be provided connecting the paved streets of the city with the Crawfordsville road. The Prest-O-Lite Company is building a new plant at Speedway, which is located on that road.

Radford Has Great Responsibility—At a recent meeting of the board of directors of the General Motors Company, Harry R. Radford was elected to the office of vice-president and general manager of the Cartercar Company, with complete charge of the factories at Pontiac, Mich. It brings the engineering department, purchasing department, manufacturing, advertising department and selling organization, with all of the branches in New York, Philadelphia, Detroit, Chicago, Kansas City, Omaha and San Francisco, entirely under Mr. Radford's direction and he alone will be responsible for their success.

Automobile Incorporations

AUTOMOBILES AND PARTS

BUFFALO, N. Y.—Gardner-Hotte Sales Company of Buffalo; capital, \$10,000; to deal in automobiles, tires, tubes and other accessories. Incorporators: J. H. Gardner, G. Hotte, W. E. Hotte.

BUFFALO, N. Y.—Studebaker Sales Company; capital, \$25,000; to deal in pleasure automobiles and accessories. Incorporators: Arthur W. Maile, Bradley M. Phillips, E. C. Schlenker.

BUFFALO, N. Y.—William Guillott Manufacturing Company; capital, \$10,000; to deal in automobile frames and stamped metals. Incorporators: William Guillott, Anna G. Guillott, Edward B. Reynolds.

CHICAGO, ILL.—Modoc Motor Car Company; capital, \$2,500; to deal in automobiles and parts. Incorporators: Otto S. Heberling, William A. Curtis, George R. Daurgana.

CHICAGO, ILL.—E. C. Kadow & Company; capital, \$25,000; to engage in the manufacture and sale of automobiles, trucks, wagons, etc. Benjamin Garler, Bertha Spever, Simon La Grou.

COLUMBIA, S. C.—Consolidated Auto Company; capital, \$5,000; to engage in the automobile business. Incorporators: J. B. Roddy, John J. Cain, J. P. Matthews.

INDIANAPOLIS, IND.—A. & M. Sales Company; capital, \$2,000; to deal in automobiles and parts. Incorporators: J. I. Handley, T. L. Marshall, L. R. Wilbur, C. C. Perrin, F. G. Sudrow.

MIDDLETOWN, N. Y.—Industrial Motor Car Company; capital, \$350,000; to manufacture and sell automobiles and parts. Incorporators: William A. Courtland, Cuthbert W. Jewell, M. G. Crawford, Harris H. Rayl, Monte-elle A. Bonneford.

MILWAUKEE, Wis.—George W. Browne, Automobiles; capital, \$5,000; to deal in automobiles and parts. Incorporators: George W. Browne, T. C. McMillan, Mark F. Browne.

MILWAUKEE, Wis.—Overland Wisconsin Company; capital, \$50,000; to engage in the automobile business. Incorporators: George W. Browne, T. C. McMillan, Mark F. Browne.

NEWPORT, KY.—Central Automobile Company of Kentucky; capital, \$15,000; to engage in the automobile business. Incorporators: Walter P. Dickerson, Gus Koehler, Clyde S. Enrick.

NEW YORK CITY.—Harmon-Yount Company; capital, \$100,500; to buy and sell automobiles. Incorporators: Daniel H. Hankel, Frederick B. Hunt, Helen M. Kelly.

NEW YORK CITY.—Holt-Chandler Company; capital, \$25,000; to deal in automobiles. Incorporators: H. E. Holt, W. E. Chandler, F. E. Tucker.

NEW YORK CITY.—Regal Auto Sales Company; capital, \$5,000; to engage in the automobile business. Incorporators: Max Hart, William M. Botto, Norman E. Manwaring.

PERU, IND.—Brown Commercial Car Company; capital, \$100,000; to manufacture automobile trucks and parts. Incorporator: R. H. Bouslog.

RICHMOND HILL, N. Y.—Dillman-Helin Motor Company; capital, \$20,000; to engage in the automobile business. Incorporators: William C. Dillman, Richard A. Dillman, E. W. Helin, Fred G. Hoerlein.

TAMPA, FLA.—West Coast Auto Company; capital, \$25,000; to deal in automobiles and parts. Incorporators: Victor A. James, Frank A. James.

TOLEDO, O.—W. H. McIntyre Company; capital, \$10,000; to deal in automobiles and trucks and to operate a repair shop. Incorporators: W. H. McIntyre, Edward L. Laskey, Clara McIntyre, William G. Vollmeyer, Frank C. Kelley.

TORONTO, ONT.—Consolidated Motors, Ltd.; capital, \$40,000; to manufacture automobiles and other vehicles. Incorporators: Alfred Hunter, Andrew H. Paterson, Garrett Tyrell and others.

YOUNGSTOWN, O.—Folberth Carburetor Company; capital, \$70,000; to manufacture carburetors and other automobile parts and accessories. Incorporators: E. A. Hegg, H. A. Emery, E. A. Tobey, Joseph F. Williams, Thomas L. Morgan.

GARAGES AND ACCESSORIES

BROOKLYN, N. Y.—Chinnock Garage; capital, \$3,000. Incorporators: Beatrice H. Mattoon, Adelaide Kenny, Edgar Chinnock.

CHARLOTTE, N. C.—McManaway's Garage; capital, \$20,000. Incorporators: I. M. McManaway, C. R. McManaway and C. G. McManaway.

Gets Tire Agency—The Brandeis Machinery & Supply Company has secured the agency for Imperial tires in Louisville, Ky.

Page Resigns from Shawmut—G. Page has resigned his position as sales and advertising manager for the Shawmut Tire Company.

Taxicab Company Moves—The Taxicab Company of Baltimore, Md., has moved into its spacious new quarters on Cathedral street near Chase.

Car Helps Advertising—Advertising the Wyoming County fair fifty-five automobiles filled with business men are touring that county in New York state.

University Adds Engine Course—The University of Southern California has added a course in the study of the Silent Knight engines to its engineering curriculum.

Garfords for Postal Work—Eleven Garford trucks, each with a carrying capacity of 3 tons, have been purchased for the handling of United States mail in New York City.

Pullman Is 6-66—In the issue of THE AUTOMOBILE for July 25 an error occurred in the name of the Pullman Motor Car Company's 1913 six-cylinder car. The correct appellation is model 6-66.

Johnston Leaves Washington—T. S. Johnston has re-

signed as manager of the Buick Motor Company's branch in Washington, D. C., to accept a position as manager of the Republic Motor Company's branch in Philadelphia.

Robinson Goes to Detroit—Hanson Robinson, for the past five years in charge of the sales of the Studebaker electric trucks in South Bend, has gone to Detroit, where he will take a position as manager of the truck sales department.

Mitchell to Double Its Output—A meeting of the distributors of Mitchell automobiles has just closed at the factory where the visitors inspected the new 1913 cars. Orders have been issued at the factory to double the output over that of 1912.

Holt Now in Charge—L. W. Holt, factory representative of the Matheson Automobile Company, has gone to Boston, Mass., where he is now in charge of the branch in that city. He is going to reorganize the service and sales-force in Boston.

Velie Employees to Picnic—The annual picnic of the employees of the Velie Motor Vehicle Company, Moline, Ill., will take place August 15 at Campbell's Island in the Mississippi River near Moline. All expenses of the outing are met by the company.

Strong Transferred to Indianapolis—E. T. Strong, manager of the Buffalo, N. Y., branch of the Buick Motor car Company, has been transferred to the Indianapolis branch of that concern and is succeeded at the Buffalo office by J. S. Collins, of Saginaw, Mich.

Porto Rico Buys Trucks—Manager John L. Snow, of the Boston, Mass., branch of the Peerless Company, shipped three trucks to Porto Rico last week, each of which will be equipped with 30-passenger bodies, for use on the island, to transport people from coast to coast.

Columbus Goodyear Branch Moves—The Columbus, Ohio, branch of the Goodyear Tire & Rubber Company, Ross A. White, Manager, which is located at 54 North Fourth street, Columbus, Ohio, will move about the 15th of August to a new building at 87 North Fourth street.

Conde Republic Sales Manager—After 4 years with the Indianapolis sales branch of the Buick Motor Company, L. H. Conde has resigned to become associated with R. H. Losey, general sales manager of the Republic Motor Car Company with headquarters in New York City.

Invents Kerosene Automobile Carbureter—Henry Reichenbach, of Chicago, states that he has invented a new carbureter that will utilize kerosene in motors instead of gasoline. Mr. Reichenbach recently tested the kerosene in a motor at Harvard University and the result was highly satisfactory.

Battle Creek Club Organized—The Battle Creek, Mich., Automobile Club has been organized with the following officers: G. H. Bathrick, president; I. Fell, vice-president; H. W. Johnson, secretary and treasurer. The club's object is to obtain fair laws, see that they are enforced, encourage good roads campaigns, aid victims of automobile thieves and discourage speeding.



Start of the Flanders electric on A. A. A. pathfinding trip

CHANGES OF CAPITAL

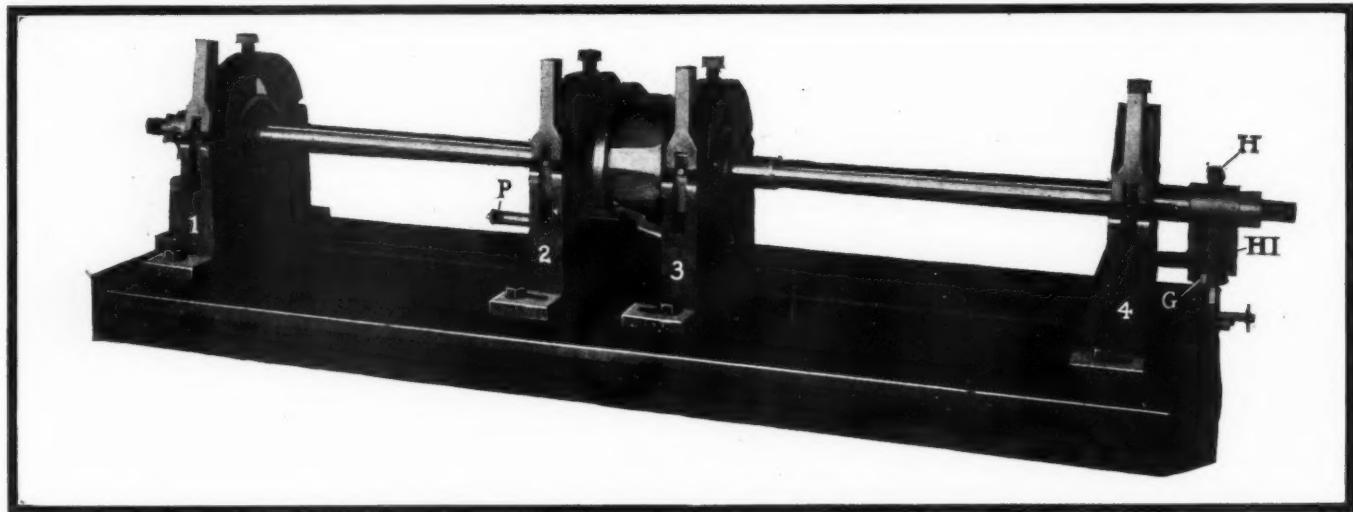
AKRON, O.—Miller Rubber Company; capital stock increased from \$500,000 to \$1,000,000.

NASHVILLE, TENN.—Imperial Motor Car Company; capital stock increased from \$6,000 to \$20,000.

PITTSBURGH, PA.—Pittsburgh School of Automobile Engineering; capital stock increased from \$5,000 to \$100,000.

YOUNGSTOWN, O.—Republic Rubber Company; capital stock increased from \$4,000,000 to \$9,000,000.

Factory Miscellany



Instrument used in the Pierce-Arrow factory at Buffalo for testing for back-lash in rear axle

The Pierce-Arrow Motor Car Company uses in its factory a delicate instrument for testing for back-lash in the rear axles of all its cars. The testing apparatus consists of four bearing supports 1, 2, 3 and 4 to carry the axle drive shafts and differential. The left side device shaft is located by pin PP; onto the end of the other axle drive shaft is attached the handle H with a short arm H1, which is set to bear lightly upon the arm of a pressure gauge G. When making a test the tester works the handle back and forth endeavoring to turn the drive shaft, and the amount of possible movement is indicated on the pressure gauge, this showing the back-lash in the axle unit.

In order to eliminate back-lash the inspection department of the factory exercises every effort to select the planetary spur gears in the differential set with respect to their size. The gears are assembled in units in the

differential housing in this department and the amount of free movement noted. If too much, a new selection of a gear or two is made and a re-arrangement results. In this selection work frequently a dozen or more gears are discarded, being over or under size by a slight variation; these eventually find their place into another unit with others of their exact size. After all of this care the testing machine illustrated herewith comes into place and gives the final test. If the back-lash is too much, the entire set of spur differential pinions is returned to the inspection department for re-selection.

David Ferguson, the Pierce-Arrow engineer, ascribes some of the chattering gearbox noises to ill-fitting differential sets, and the company has taken this signal step in noise elimination to meet the requirements for the silent rear axle, so much demanded by car users to-day.

OAKLAND Factory's Coming Increase—That the Oakland Motor Car Company, of Pontiac, Mich., will turn out 11,500 cars next season is the announcement made by George E. Daniels, vice-president and general manager of the company. To provide for this increase in output a number of factory additions will be made, providing in all for 300,000 square feet of additional space. The fiscal year just closed has been the most successful in the history of the company, according to Mr. Daniels. For 1913 the company have added a six-cylinder chassis and another popular-priced car to sell at \$1,075. The Greyhound 60, the new six-cylinder chassis, has a wheelbase of 130 inches, double-drop frame, unit power plant, cone clutch, sliding-gear transmission, floating rear axle, demountable rims, V-shaped German-silver radiator, 10-inch upholstering, full nickel trimmings, electric lights and a self-starter.

Moline is Expanding—The Moline Auto Company is to build an extension to its East Moline, Ill., plant, a building 60 by 60 feet to be constructed for use as repair shop and repair stock room.

Piston Ring Makers May Move—The Muskegon Piston Ring Company, of Muskegon, Mich., now manufacturing motor specialties here, is considering the removal of its plant to Muskegon Heights.

Fisk to Make Additions—The Fisk Rubber Company is making extensive additions to their plant in Chicopee Falls, Mass., in order to take care of the increased demand for automobile tires. The contracts have been let to the Fred T. Ley Company, of Springfield, for two buildings. Buildings

are to be completed and machinery installed by November 1, 1912.

American Castings Company Alive—The American Castings Company, of Mishawaka, Ind., has just installed new equipment, including molding machinery, pneumatic tools and other apparatus. It is also erecting an addition to its plant and has taken on a number of men in the mechanical department. The company has just received an extensive order from an automobile engine company at Harvey, Ill. The company manufactures aluminum castings.

Irvin Body Factory Enlarged—An additional factory building is being erected at Morris and Division streets, Indianapolis, Ind., for the R. J. Irvin Manufacturing Company, which manufactures motor car bodies and tops. The building will be two stories high, of brick construction, 50 by 407 feet, and will cost about \$50,000. The Irvin company also has one building 50 by 275 feet and another building 50 by 126 feet.

Commercial Club Activities—The Commercial Club of Columbus, Ind., has completed selling 150 building lots, which sale was necessary to obtain a \$250,000 factory which will manufacture motor cylinder castings. Of the \$45,000 obtained by the sale of lots, \$25,000 is to be used in paying the debts of the Caldwell Manufacturing Company, whose plant is to be taken over by the new company, which will be incorporated with \$75,000. Those interested in the new company are J. I. Handley, of Indianapolis, president of the Marion Motor Car Company and of the American Motors Company; S. H. Penfield, Fletcher Goodwell and Benjamin S. Dean, of Jamestown, N. Y.

Mercer Adds to Plant—The Mercer Automobile Company of Trenton, N. J., will build a new factory, measuring 160 by 161 feet. Plans are also being drawn for a new office building. It expects to occupy the new quarters before Fall.

Steiner Wants to Remove—The H. A. Steiner Company, of Chilton, Wis., manufacturing gasoline engines and motors, is negotiating with local capitalists for re-location of its works. A bonus of \$13,000, to be subscribed for its stock, is demanded.

Buick Not Moving Yet—The Boston, Mass., branch of the Buick company has been delayed in getting into its new salesrooms at the corner of Massachusetts avenue and Newbury street because the work of alteration, which is very extensive, has not been completed.

Chevrolet Buys Imperial Factory—It is reported on good authority that the Chevrolet Motor Company has purchased the Imperial Wheel Works plant in Flint, Mich., and will open a factory there on September 1. This factory has been secured as a branch plant to the Detroit factory and it will be used for the manufacture of motors for the new Chevrolet cars.

Mason Motor Company Growing—The Mason Motor Company, of Flint, Mich., after a year of business, has found it necessary to add 15,000 square feet of space to its present plant. The fiscal year of the company closes September 1 and it is expected that by that time 2,500 motors will have been turned out. The company manufactures motors for the Little Motor Company's cars.

Champion Ignition Company's Increase—Work has been begun on an addition to the plant of the Champion Ignition Company, Flint, Mich. At the present time the company is supplying about eighty-six manufacturers of automobiles with spark-plugs and the number will be increased to 120 within the next two months. The company employs about 120 persons, of whom about eighty-five are women.

Marvel Carbureter to Remove—Announcement is made that the Marvel Carbureter Company, Flint, Mich., has entered into a contract with the local board of commerce to remove its plant to this city from Indianapolis, Ind. The company has a well-established business in Michigan and the change is said to be largely due to a desire to get into the center of the automobile manufacturing industry.

Durant-Dort Develops Departure—After more than a year of experimenting the Durant-Dort Company, of Flint, Mich., has decided upon a new departure. The company has de-

cided to engage in the manufacture of light motor delivery wagons and has secured the material for the first 100. The class of car will be similar to that of the horse-drawn vehicle now manufactured by the company.

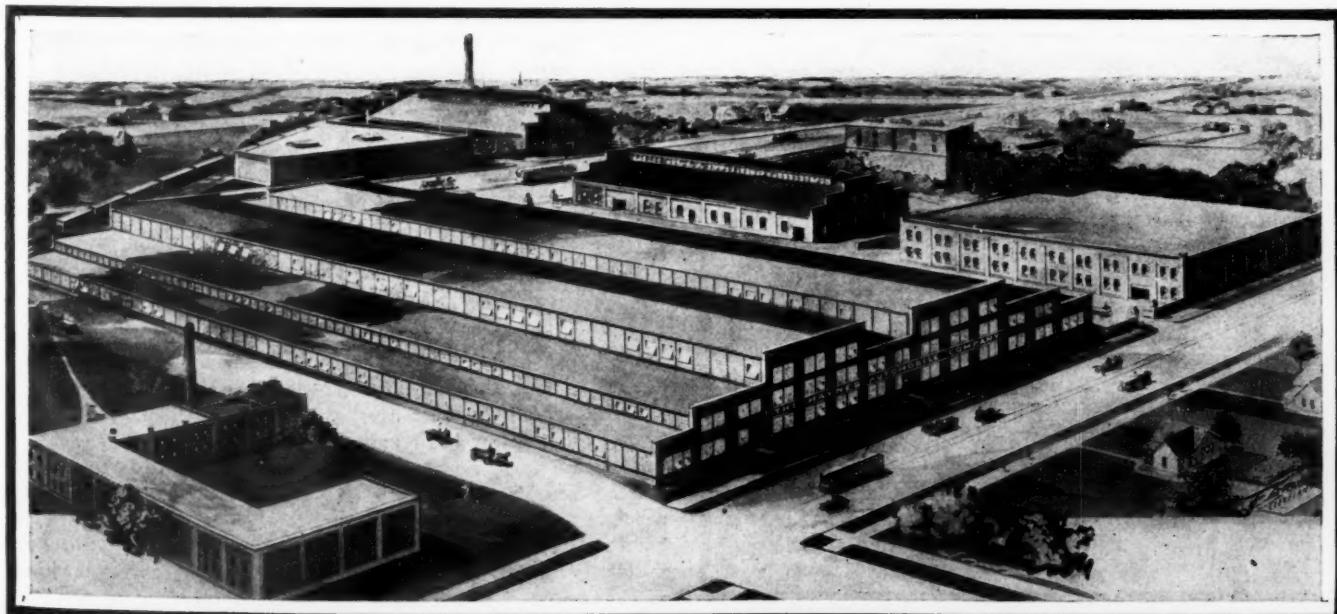
Pharis Brothers Go to Ohio—The Pharis Brothers Rubber Company, of 121 East Gay street, Columbus, O., has closed a deal for the purchase of the Newark Tire & Rubber Company, of Newark, O., and will remove the plant to Columbus as soon as a suitable location is secured. The Pharis Brothers Company has been selling the Pharis tire manufactured by the Mansfield Tire & Rubber Company, of Mansfield.

Rambler Wants to Expand—Nine acres of ground adjoining the present holdings have been purchased by the Thomas B. Jeffery Company, of Kenosha, Wis., to provide for future extensions. The increased output planned for 1913 necessitates several enlargements, which will be made in the course of the coming six months. Definite plans are now being prepared under the direction of Charles T. Jeffery, president and general manager.

Leech Company Ready to Build—The Leech Automobile Company, Lima, O., which was incorporated three years ago for the purpose of carrying on experiments with a new style of gasoline engine, is now ready to erect a plant for the manufacture of the engine. In addition to manufacturing automobile engines, the company will also make a line of parts for motor cars and commercial vehicles. It is believed the plant will be located at Lima.

United States Tire Activities—The Kenosha Industrial Association, of Kenosha, Wis., is negotiating with the United States Tire Company for the location of its proposed new tire and rubber plant, which will have an output of between 500,000 and 750,000 tires annually. The United States Tire Company is looking for a location in a small city near Chicago, and if the Kenosha association can offer sufficient inducements the location is promised.

Stegeman Plans Increase—The Stegeman Motor Car Company, 1148-1160 Holton street, Milwaukee, Wis., manufacturing the Stegeman commercial vehicles, has leased the big manufacturing plant at Woodworth, Linus and Kinnickinnic avenues, Milwaukee, in the Bay View manufacturing district, and will at once increase its capacity to one truck per day, or 360 per year. The work of removing the equipment from the Holton street works has already begun and will be completed by August 10.



Showing a bird's-eye view of the enlarged plant of the Haynes Automobile Company at Kokomo, Ind.



Rajah Spark-Plugs; Electrically-Driven Tire Pump; Shaler Garage Steam Vulcanizer; Single-Hole Imported Acetylene Burner; Radiator Cleaning Compound; Jiffy Side Curtains; Glasses Excluding Ultra-Violet Rays

Rajah Giant and Starter Plugs

IN Fig. 1 are shown two plugs manufactured by the Rajah Auto-Supply Company, Bloomfield, N. J. Both types are shown in a side view and an inclined one, and their principal feature is their evident strength of construction. Both plugs are high-duty designs, in which the insulation is of imported porcelain while the metal parts are correspondingly strong. The electrodes are of imported wire made of a special alloy designed to withstand the exigencies of hard service and the sparks produced by powerful magnetos. The shapes of shell and porcelain are such as to prevent short-circuits even if the cylinders are oiled very liberally. A copper gasket is inserted between shell and porcelain, so that the whole plug consists of but four parts, not considering the clip terminal which is supplied with every plug.

The self-starter plug shown in the same figure has a shoulder at its lower end carrying a yoke which is held in place by a jam nut. There is a gasket on each side of the yoke between shoulder and jam nut, forming a gastight connection. The yoke is grooved with a passage continued by one which is bored in the plug shell and through which the acetylene coming from the tank and through the dashboard distributor valve enters the cylinder, surrounding the sparking points and being ready for ignition when the switch is thrown on. The porcelain of this plug is held in a brass bushing, which may be removed by a wrench without disturbing the position of the plug in the cylinder or disconnecting the gas line through which the acetylene

enters. All parts of this plug are made interchangeable and reserve parts may be procured from any agent of the manufacturer. The starter plug is made in two thread sizes, 1-2 inch standard and 7-8 inch S. A. E.

The illustration indicates the pleasing appearance of both types of plug, the dimensions of which indicate strength. The 7-8 inch self-starter plug has a diameter of 1 5-16 inches at the copper gaskets and a total height, from negative electrode to binding-post cap, of 3 3-4 inches.

Ingersoll-Rand Tire Pump

A recent addition to the line of electrically-driven garage tire pumps is the one shown in Fig. 6, and made by the Ingersoll-Rand Company, of New York City. The pump equipment, comprising an electric motor and a piston pump, is mounted upon a base plate supported on two short feet and two casters and fitted with a handle. The entire outfit weighs 75 pounds, is 27 inches long, 11 wide and 23 inches high. The pump, which has a cylinder of 1 by 1 1-2 inches, is driven by a 1-2-horsepower elec-

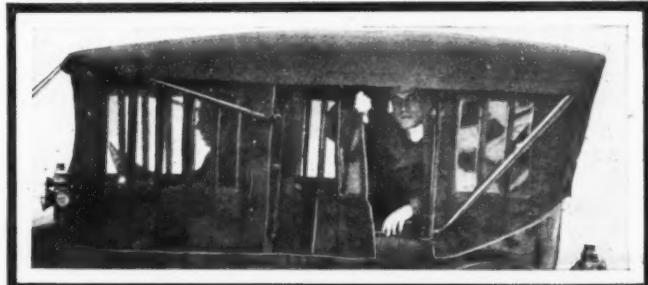


Fig. 3—Jiffy automobile side curtains folding into the top

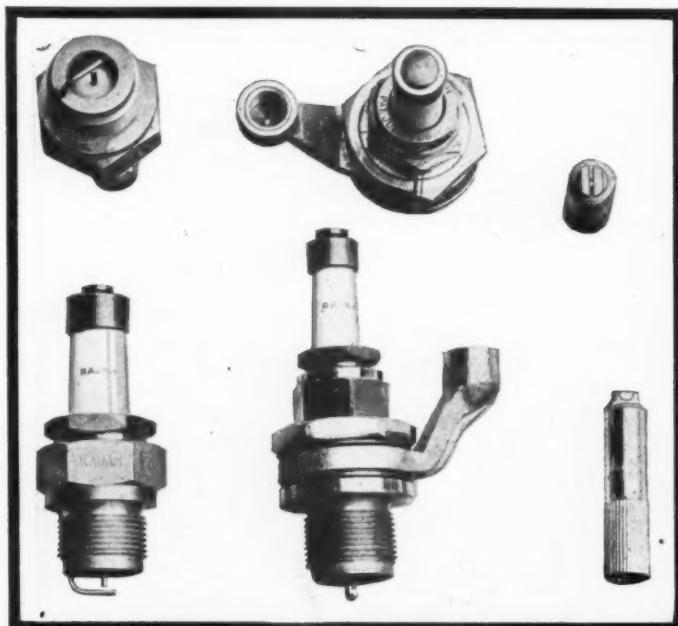


Fig. 1—Rajah Giant and starter plug. Fig. 2—Bray-Ronl burner

tric motor, and is of the air-cooled type. It is capable of pumping a 35 by 4-inch tire in 3 minutes from flat to 70 pounds, or, in 3 1-2 minutes, to 80 pounds. The electric motor may be connected to any current socket furnished with city installations. To transmit the air from the pump to the tire 6 feet of 1-2-inch hose is included in the equipment.

New Shaler Garage Vulcanizer

The latest product of the C. A. Shaler Company, Waupun, Wis., is the garage type of vulcanizer shown in Fig. 5. This device is operated by steam, the heat being produced by a gasoline burner fed from an overhead reservoir. The apparatus is equally suitable for the repair of casings and inner tubes, molds serving the former purpose and plates heated inside the latter. The equipment, which stands on two legs L, is arranged at such a height as to insure ease of operation, where a man of medium height does the repair work. The casings treated in this vulcanizer, which is of the wrapped-tread type, are covered with a piece of material protecting the damaged portion from direct contact with the hot surfaces. When an injured casing is vul-

canized in this machine the wound is first cleaned, then the worn-out sections are replaced by live rubber and fabric, after which the heat treatment is resorted to. The heat is applied to the inner and outer surface of the casing, the inner mold being carried by the two supports *S*, while the outer one is shown at *M*. They are tightened on the casing by bolts held in a channel clamp. Both these molds are connected by flexible steam pipes to the coiled copper-tube boiler, to which the gasoline is fed by gravity through tubes *T*. Inner tubes are vulcanized between the plate *P* and upper plates *Q*, being pressed in place by clamps *K*. The supports *S* serve for hanging inner tubes thereon, while other work is being done on the equipment. The pressure of the steam and its temperature are automatically regulated by a thermostat, which prevents under-curing or burning of casings and tubes. A gauge which is attached to the boiler shows the steam pressure at any moment. The water contained in the boiler is transformed into steam very quickly, so that after 20 minutes it is ready for the vulcanization of tires.

Bray-Roni Acetylene Burner

The William M. Crane Company, 18 West Thirty-second street, New York City, is the distributor for the imported Bray-Roni acetylene burners, Fig. 2. These burners, which are

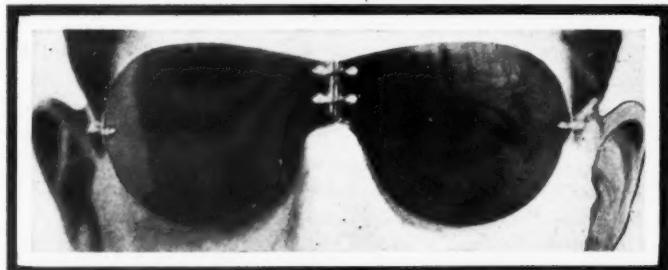


Fig. 4—Hardy Autosun glasses absorb rays which fatigue the eye

made of an imported material held in a nickel-plate brass base, are without the conventional prongs and have but one outlet for the gas coming from the tank, which is located in the center of the top end of the burner. On both sides of this hole there is an elevation in the burner material and between these portions there are two lateral openings between which the air used in the combustion of the gas is admitted, being sucked in by the fast-ejected acetylene. The air, rushing into the flame at two sides, produces a wide, flat flame having the same appearance as one produced in a burner with two prongs from which two pointed flames impinge upon each other. One of the chief features of this burner is that one small gas aperture cannot be clogged up as the pressure of the gas flowing out of it forces out all small foreign matter, so that there is no place for it to accumulate except in the passageway between the elevations at each side of the gas hole. This foreign matter is easily cleaned from these points by means of an old toothbrush.

Apex Cleanser for Radiators

A compound which dissolves the scale deposits in the water-cooling system is sold, under the name Apex Radiator Cleanser, by the U. S. Compound Company, Buffalo, N. Y. The liquid, which comes in cans of various sizes, is mixed with the radiator water in the proportion of 1 ounce to a gallon of water and is left in the system, being drained after a week with the dissolved deposits. The appearance of the liquid is somewhat similar to honey, both as regards color and viscosity.

Jiffy Invisible Side Curtains

A waterproof side curtain, which is operated from the seat, perfectly shields the passengers of a car from inclement weather, and, when not in use, folds invisibly up into the top, is made by the Jiffy Auto Curtain Company, Detroit, Mich. As shown in Fig. 3, each curtain consists of a number of sections made of

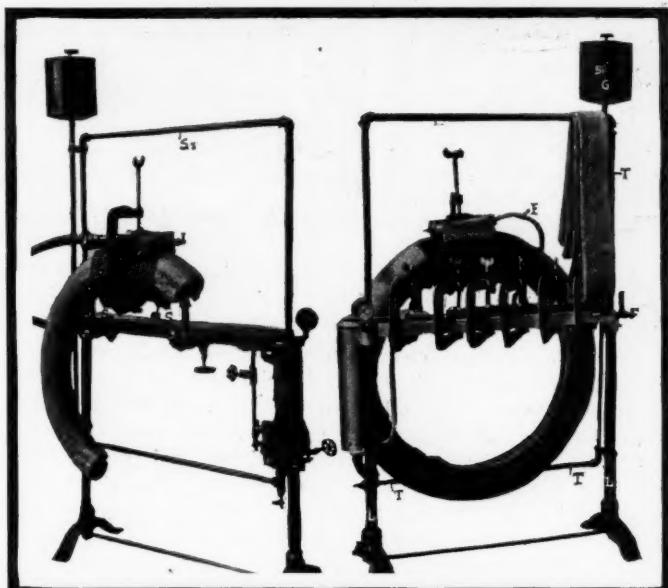


Fig. 5—New Shaler wrapped-tread, garage steam vulcanizer

waterproof material and fitted with windows of celluloid or another transparent material. Adjacent sections are connected by hinge joints which permit of folding one section around another. The top edge of each section has apertures through which extend wire-cable supports along the side of the automobile top. When this is the case, all the curtain sections are in the same plane and form practically one continuous curtain, but it is possible to slide the sections along the cable supports, arrange two or more behind one another, roll them together and attach them to the material of the top by straps. Adjoining sections are held together, when in service, by a snap button, so that the whole device may readily be put into or out of operation. The Jiffy side curtains may be installed upon an automobile of any make.

The Hardy Autosun Eye-Shield

A new addition to the line of automobile goggles made by F. A. Hardy & Company, 31 Wabash avenue, Chicago, Ill., are the Autosun glasses, Fig. 4. These glasses are made in the conventional Hardy design, but are distinguished by the peculiar shade of smoking which gives the glasses a brownish tint, making their use very easy on the eye. This particular smoking of the glass is effective in absorbing the ultra-violet rays, which otherwise prove very tiring to the eye, so that through the use of the Autosun glasses the eyes of the driver are kept fresh and guarded against strains, while the color scheme of the impression he receives of his surroundings is almost the same that he would get with eyes unshielded. The glasses are held together by a simple bridge which is so formed as to be easy on the nose, and the same idea is carried out in the design of the elastic braces which attach the glasses to the ears and are covered with a soft fabric.

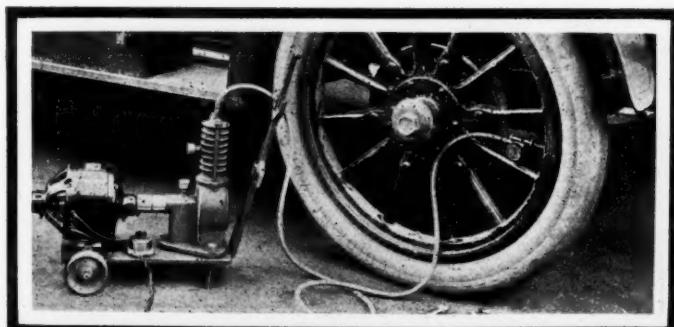


Fig. 6—Ingersoll-Rand electrically-driven garage tire pump



Patents Gone to Issue

AUTOMOBILE SHOCK-ABSORBING DEVICE—In which a piston moving in a liquid together with a coiled spring effects the absorption.

The shock-absorber described in this patent consists of a pair of reciprocal supports R, Fig. 1, forming a housing which encloses a chamber partly filled with a liquid. Along the entire length of these supports extends a coiled shock-absorbing spring S which returns the two supports to their original relative position after it has been disturbed by the movement of either support. Within the chamber there is a piston P and a partition P₁ spaced from the piston; the partition has a port in it and with the piston forms two walls of an auxiliary chamber in which there is a valve moved by and subject to the liquid pressure.

No. 1,033,348—to Emile Rimalho, Neuilly-sur-Seine, France. Granted July 23, 1912; filed December 30, 1909.

Spring Suspension for Automobiles—Composed of two rigid bars secured to each other by movable end-connections.

This patent refers to a spring device, Fig. 2, which consists of two elongated, curved, rigid metal bars B₁, B₂, extending in the same direction. They are separate from each other, but curve against each other, one being attached to the axle of the automobile and the other to the body. The ends E₁, E₂ of the two bars are connected to one another, and at least one of these two connections is movable. At different points between the bar ends are coiled springs fastened in vertical position to the bars.

No. 1,033,429—to Thomas J. Magner, Olean, N. Y.; George A. Larkin. Granted July 23, 1912; filed October 12, 1910.

Rear End Indicator Signal—In which a rotatable casing carries indicator signs.

This device, Fig. 3, combines the use of a substantially triangular casing C with a shaft S upon which the casing is

mounted. The casing is so attached to the shaft as to rotate with it when the latter is turned. A pair of cranks set off against each other at an angle of 120 degrees are carried by the shaft, and an operating rod is connected to each crank.

No. 1,033,305—to Arthur B. Demuth, Diego, Cal. Granted July 23, 1912; filed June 26, 1911.

Recoil Checking Mechanism—Being a cylinder filled with a liquid in which a piston reciprocates.

The subject-matter of this patent, a shock and recoil absorber, is shown in Fig. 4. It consists of a cylinder C in which there is a piston P, a piston rod R attached to the piston and having a guiding bore and a valve chamber C₁. Lateral ports open into this valve chamber presenting passageways with the main interior space of the cylinder. A sliding piston valve V in the chamber C₁ is provided with a head having a cylindrical surface; the latter co-operates with the cylinder ports. The cylinder C carries an axial guide rod in engagement with the valve.

Wrench Construction—In which a rack on the shank end on the movable jaw are held in engagement to insure a fast grip.

This wrench, Fig. 5, comprises a shank S, the front side of which carries a rack R which is not as wide as the shank. The outer end of S carries a jaw J, and a jaw body B embraces the shank; a stem S₁ has its inner end pivoted at P in the jaw body and is beveled to engage the rear side of the shank S. A longitudinal groove G is formed in the front side of the stem, in which one end of a flat spring S₂ is mounted, the spring bearing against the rear side of the shank, thereby maintaining it at a fixed angle to the stem. A gripping block B₁ is movably arranged in recesses formed in the jaw body engaging the shank.

No. 1,034,138—to William G. Natzmer, McKeesport, Pa. Granted July 30, 1912; filed March 29, 1912.

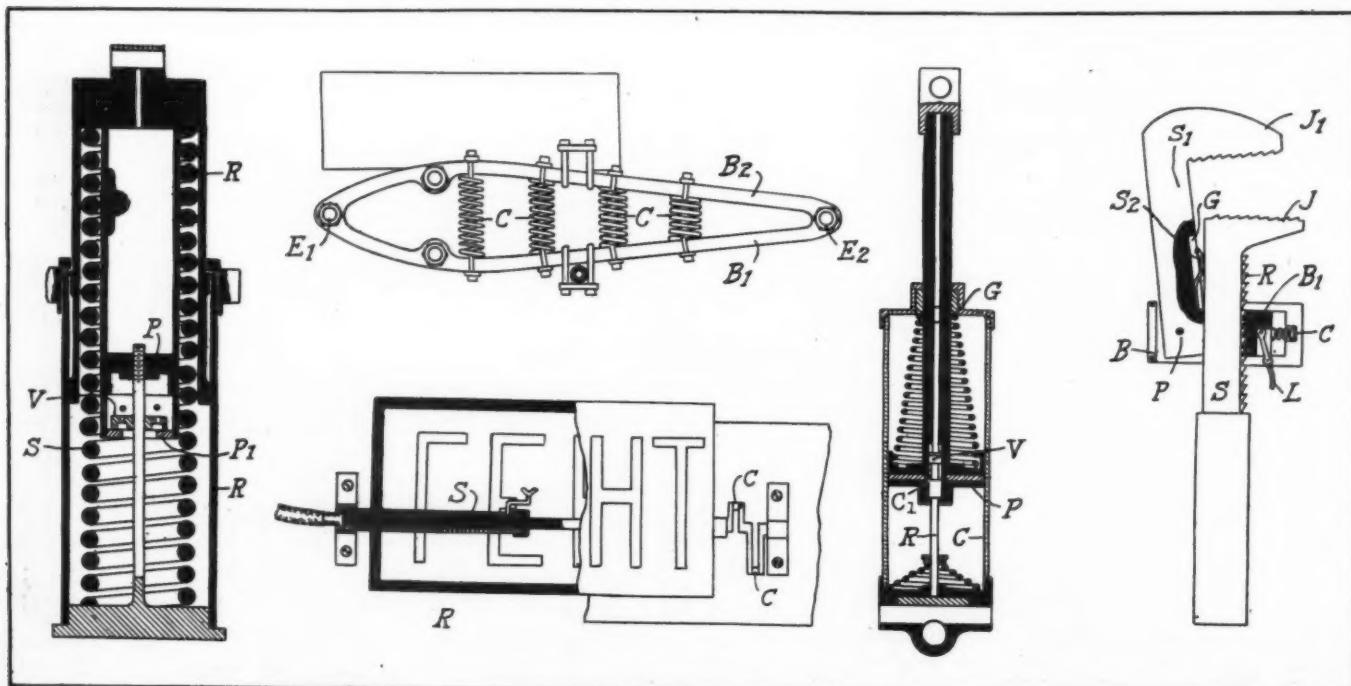


Fig. 1—Rimalho's shock absorber. Fig. 2—Wagner suspension. Fig. 3—Demuth rear-end signal. Fig. 4—Johnson recoil check. Fig. 5—Natzmer wrench